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48(2).[?]











# INDEX

TO THE

## EXECUTIVE DOCUMENTS

OF THE

### HOUSE OF REPRESENTATIVES

FOR THE

SECOND SESSION OF THE FORTY-EIGHTH CONGRESS,

1884-'85.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1885.





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BEING PART OF  
THE MESSAGE AND DOCUMENTS  
COMMUNICATED TO THE  
TWO HOUSES OF CONGRESS  
AT THE  
BEGINNING OF THE SECOND SESSION OF THE FORTY-EIGHTH CONGRESS.

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IN FOUR VOLUMES.

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VOLUME IV.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1884.



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# REPORT

## OF THE

# CHIEF SIGNAL OFFICER.

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SIGNAL OFFICE, WAR DEPARTMENT,  
*Washington City, October 15, 1884.*

SIR: I have the honor to submit herewith my report upon the work of the Signal Service during the fiscal year ending June 30, 1884, and also to add a summary, made necessary by the subsequent return of Lieutenant Greely, of the work and relief of the Lady Franklin Bay Expedition.

### INSTRUCTION AT FORT MYER.

The course of instruction pursued at Fort Myer has been enlarged and otherwise improved. An appendix (No. 1) containing the courses for officers and men and the standing orders governing the School of Instruction accompanies this report. It is the theory that all who are connected with the corps shall be constantly available for all branches of military service for which the Signal Corps is maintained. In this connection it is unfortunate that Congress failed to provide for horses for the corps. When in the field, the men must be mounted, and although the telegraph train, recognized by all powers as most essential in modern warfare, must be moved by horses, not one animal is at my command available for these purposes. Through no fault of the service, it has, for two years, been impossible to teach the men to ride or to manage the telegraph train in the field. With these disadvantages the work of signal instruction has been carried on. Instruction and practice in signaling, by flag, torch, and heliograph, and in telegraphy, has been given.

The annual report of the officer in immediate command of Fort Myer will be found in Appendix 2.

### INSTRUCTION IN METEOROLOGY.

During the year five officers completed the course of instruction at Fort Myer. Sixty-nine enlisted men were instructed in signaling, telegraphy, elementary meteorology, and in their duties as soldiers.

In addition to the above, two officers have completed the course of instruction at this office required of officers charged with the preparation of weather predictions, the announcement of approaching frosts, and the ordering of danger signals.

The number of officers available for this important branch of the service is too limited, and the best results can only be expected when the officers selected for this work are enabled to devote their whole time to the study of meteorology.

Owing to the limited force of officers available for duty, the instructed officers have been called upon for executive work, and but little time has been available for special study.

The popular interest in the study of meteorology, stimulated by the work of the Weather Bureau of the Signal Service, is increasing. Institutions of learning are giving meteorological instruction a place in their *curricula*, and in order to meet the demands made upon the service in this connection, lectures have been given during the year by officers and professors connected with the office, and an elementary textbook, intended for use in normal and high schools, is in course of preparation.

The text-books on meteorology, available for use in this country, are, in some respects, unsatisfactory, and it is apparent that a new work is needed, treating the subject from a point of view radically different from that employed in works extant. The preparation of such a treatise is now in progress by gentlemen connected with the office.

An important contribution to the literature of meteorology and kindred subjects has been made during the year by the publication of Professional Paper No. XIII, Professor Ferrel's "Temperature of the Atmosphere and the Earth's Surface." Near the close of the year the service began the publication of Professional Paper No. XV, "Researches on Solar Heat and its Absorption by the Earth's Atmosphere," in which Prof. S. P. Langley, director of Allegheny Observatory, reports upon the work of the Mount Whitney Expedition, undertaken by him in 1881, and sets forth a number of deductions from the data there obtained. It is hoped to give this important memoir to the scientific public early in the current fiscal year.

It is desired to have soon available a number of translations of the works of Guldberg, Mohn, Schoch, and Sprung, now in course of preparation.

The attempt made during the last three years to secure the enlistment of young college graduates has met with gratifying success. Of the two hundred and fifty-one enlistments made during that time sixty-five were of college graduates. They have been placed, as far as practicable, under instruction to qualify them for that work of the service requiring more than ordinary knowledge of mathematics and physics, especially in electricity, magnetism, etc.

#### APPROPRIATIONS.

It is my duty to again call your attention to the crippled condition in which the Signal Service has been left by the last two appropriation acts. Congress has made it impossible to carry on the full work of this bureau, and, as a consequence, seventeen stations of the meteorological service have been closed in order to send men to the telegraph lines, although a large part of the frontier lines have been abandoned, having been supplemented by commercial lines. The meteorological stations abandoned were selected with great care, but need of their data is greatly felt.

The appropriation laws of the last two fiscal years were framed under the expressed wish of Congress to separate the appropriations for this service from those made for the support of the Army. From its organi-

zation until recently the Signal Service has been provided for as a part of the Army, and it is now recommended that while the items of appropriation for the service remain separate and specific they be made as a part of the appropriations for the Army.

While some of the deficiencies of the appropriation laws for the last fiscal year have been made up, the appropriations for the current year omit provision for a number of items, which, although individually of minor importance, collectively are necessary for the complete well-being of the service. No forage was provided for horses of officers other than those of the Chief Signal Officer, and no provision was made for ordnance and ordnance stores for the corps. Extra duty pay for men employed continuously, under the laws of Congress, for more than ten days upon skilled duties or labor not strictly military was not provided for, causing a reduction in the earned allowances of the most meritorious and skillful men in the service, while the men at Fort Myer who labor for the proper service of the post just as men at other posts do, who receive therefor extra pay, can receive nothing. This is an unjust discrimination against the enlisted men of the Signal Corps of the Army.

Captain S. M. Mills, 5th Artillery, has acted as property and disbursing officer of the Signal Corps during the year ending June 30, 1884, and his report, showing the work performed under his immediate direction, is given in Appendix No. 3.

*Statement of amounts appropriated for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1884.*

**Legislative, executive, and judicial:**

Regular clerks, messengers, &c .....	\$10,660 00
Scientific experts, clerks, &c .....	40,000 00
Postage stamps, postal union countries, allotted by Secretary of War .....	1,200 00
Stationery, allotted by the Secretary of War .....	3,400 00
Rent of buildings for signal office .....	7,000 00
Official postage, allotted by the Secretary of War .....	40,000 00
Fuel and light .....	1,107 24

**Total .....** 103,367 24

**Sundry civil expenses:**

Observation and report of storms, Manufacture, purchase, and repair of instruments .....	\$5,500 00
Telegraphing reports .....	136,000 00
Expenses storm signals .....	10,000 00
Cotton-belt reports .....	7,000 00
Connecting life-saving stations .....	5,500 00
Instrument shelters .....	500 00
Rents, &c., of offices outside of Washington .....	40,000 00
Office furniture in Washington .....	1,000 00
River and flood reports .....	5,000 00
Maps and bulletins .....	25,000 00
Books, periodicals, and stationery .....	6,000 00
Incidental expenses .....	1,000 00

**Total .....** \$242,500 00

Maintenance and repair of military telegraph lines .....	\$35,000 00
Observations and explorations in the Arctic seas .....	\$33,000 00

**Pay, &c., of the Signal Corps:**

Pay of officers .....	\$19,500 00
Pay of enlisted men .....	200,000 00
Mileage to officers .....	5,000 00
Pay of contract surgeons .....	3,600 00
Commutation of quarters to officers .....	7,000 00

**Total .....** \$235,100 00

## Sundry civil expenses—Continued.

## Subsistence Department:

Stores, Lady Franklin Bay .....	\$5,000 00
Stores, Point Barrow .....	3,000 00
Subsistence and commutation of rations, Signal Corps.....	148,727 72
Commutation of rations, men with expeditions .....	8,052 00

Total ..... \$164,779 72

## Quartermaster's Department:

## Regular supplies—

Fuel.....	\$6,295 00
Commutation of fuel at \$9 per month.....	23,760 00
Commutation of fuel at \$8 per month.....	23,328 00
Forage for mules and horses.....	3,100 00
Stationery.....	100 00
Stoves.....	706 25
Lights.....	362 50

Total ..... \$57,651 75

## Incidental expenses—

Horse and mule shoes .....	\$500 00
Blacksmith's tools .....	550 00
Veterinary supplies .....	300 00
Fire apparatus, disinfectants, &c. ....	125 00

Total ..... \$1,475 00

## Transportation—

Supplies, &c. ....	\$25,000 00
Officers and men .....	8,875 00
Means of, mules.....	700 00
Means of, spring wagon .....	200 00
Means of, repairs to .....	500 00

Total ..... \$35,275 00

## Barracks and quarters—

Commutation of quarters.....	\$84,108 00
Work and supplies at Fort Myer.....	1,800 00

Total ..... \$85,908 00

## Clothing and camp and garrison equipage—

For sergeants .....	\$6,937 50
For corporals .....	1,375 20
For privates .....	14,182 40
For detailed men .....	990 00

Total..... \$23,485 10

## Medical Department:

## Medical attendance and medicines, officers and men, Signal

Corps.....	\$3,500 00
Medical attendance and medicines, officers with Signal	
Corps.....	100 00
Medical and hospital supplies, Fort Myer .....	900 00
Medicines from depots, &c. ....	1,000 00
Material, repairs to hospital, Fort Myer.....	200 00

Total ..... \$5,700 00

## Support of the Army:

Expenses Signal Service, U. S. Army .....	\$5,000 00
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Grand total..... \$1,028,241 81

Many private persons, institutions of learning, &c., purchase their instruments through this office, because of the advantage afforded to obtain greater accuracy, by having the instruments compared with our

standards, for which no extra charge is made. Of these there have been purchased two hundred and ninety-three instruments at a total cost of one thousand seven hundred and seventy-five dollars and thirty cents

The duties of collecting line receipts, settling accounts for business transferred to connecting lines, examining and correcting telegraph accounts and preparing these accounts for transmission to the Treasury Department, require much attention, and involving, as they do, a large monetary responsibility, too much care cannot be exercised.

The receipts from these lines have been collected and covered into the Treasury without the loss to the United States of a cent. This is a noteworthy feature, considering the extent of territory covered, the isolated position of stations, and the poor facilities many of the operators have of transmitting money to this point.

While the amount of money collected on these lines is not as large as in former years, an equal amount of care and labor is required to account for it.

It is especially urged that steps be taken toward providing for a means of remitting line receipts, whereby the risk of loss will be reduced to the minimum, and I would suggest that Congress be asked to allow the expense of remitting line receipts to be paid therefrom. There have been no losses during the past year on account of failures in the mail service, but should a single registered package be lost the contents are irrecoverable, and, as most of the remittances contain money for other lines, the way to a settlement of their claim, under the present law, is not plain.

#### INDICATIONS.

The weather forecasts and storm warnings issued from this office have been sought for and published by the daily journals throughout the country, and the increasing demands for special predictions in the interests of agriculture, special trades, and commerces indicate in a measure the practical value of this important division of the Signal Service.

The Special Bulletin, which is a new feature of the weather forecasts of this office, is issued at 10 a. m. daily, and contains a more general account of the meteorological conditions than it is possible to give in the indications. The bulletins are intended to inform the public of approaching cold waves, general storms, frosts, extreme temperatures, etc., and contain forecasts applicable to the succeeding forty-eight hours from the date of the bulletin. When practicable, the midnight indications close with a special forecast of the weather and temperature for the day following that for which the regular indications are prepared.

The following tables show the percentage of accuracy of the indications, considering the four meteorological elements for which forecasts are made. With a view of ascertaining the character of the work performed in this division I have required each forecast to be carefully analyzed and a comparison made of the conditions anticipated and those actually occurring during the time for which the indications were made. The rules by which these percentages have been computed have been revised, and instructions issued prohibiting the use of ambiguous language in the weather forecasts. With these improvements in the wording of the indications and the more rigid manner of determining the

accuracy of predictions, I am able to report an improvement in the work of this division, and further improvements could be made by an increase of stations, especially in the West and Northwest. No general storm has passed over this country during the year without warning.

The sudden approach of storms from the Atlantic occasionally cause unexpected changes in the atmospheric conditions, leaving but a limited time for warnings to be issued. The service is greatly aided in this feature of the work by the stations on the sea-coast telegraph line, and a station at the Bermudas would add greater security from the danger of this class of storms.

*Percentage of "Indications" verified, for the year ending June 30, 1884.*

Districts.	1883.						1884.						Annual averages.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
New England.....	88.8	88.0	87.5	89.5	81.2	85.2	88.3	88.3	83.6	76.7	79.7	80.4	84.6
Middle Atlantic States.....	90.3	91.1	89.4	90.5	90.0	86.7	91.7	87.1	83.5	83.1	84.4	84.2	87.7
South Atlantic States.....	84.6	84.5	85.9	89.9	58.0	82.6	89.9	84.2	84.4	86.8	84.2	84.4	85.8
Eastern Gulf States.....	86.8	86.5	86.4	90.8	88.2	83.6	91.3	83.0	81.4	85.6	83.9	85.9	86.1
Western Gulf States.....	89.8	90.7	88.6	90.8	87.7	85.6	89.5	86.0	79.7	86.7	84.9	88.3	86.4
Lower lake region.....	85.6	88.3	88.0	89.7	87.2	86.4	88.7	86.5	84.0	82.8	79.9	81.7	85.7
Upper lake region.....	88.0	85.3	84.6	91.7	86.3	86.0	87.5	83.5	83.7	82.5	78.0	82.2	85.6
Tennessee and Ohio valley.....	87.0	89.0	92.1	89.6	89.7	84.4	90.6	82.7	84.0	85.2	81.8	85.9	86.8
Upper Mississippi valley.....	87.9	83.9	87.2	92.1	82.4	84.0	87.9	82.0	83.0	84.9	78.4	85.9	85.0
Missouri valley.....	82.6	81.4	85.1	87.7	72.8	83.4	84.3	74.9	78.9	82.4	78.6	80.0	81.0
Monthly averages.....	86.9	86.9	87.5	90.2	85.4	84.8	89.0	83.3	82.6	83.7	81.4	82.4	85.4

The "indications" for the districts named in the above table were for character of weather, direction of winds, and changes of atmospheric temperature and pressure.

The following table shows the percentages of verifications for the Pacific coast regions, the predictions being for character of the weather only :

Districts.	1883.						1884.						Annual averages.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
North Pacific coast regions..	100.0	100.0	86.5	75.0	92.0	89.8	83.0	78.1	72.4	90.7	86.3	75.9	85.8
Middle Pacific coast region..	100.0	100.0	94.0	93.0	81.0	87.0	84.5	100.0	88.2	81.0	87.1	91.7	90.0
South Pacific coast region....	100.0	87.9	98.2	96.6	96.3	93.2	83.6	81.2	92.1	79.4	93.5	89.2	91.4
Monthly averages.....	100.0	99.3	92.9	88.2	89.8	90.0	83.7	86.4	84.2	83.7	87.6	86.6	89.2

The following table shows the number of cautionary signals ordered during the year ending June 30, 1884, with the number and percentages that were justified:

Month and year.	Cautionary signals.			Cautionary off-shore signals.			Cautionary north-west signals.			Total number of signals ordered.	Total number of signals justified.	Percentage of total number of signals justified.
	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.			
1883.												
July .....	67	43	71.6	8	5	75.0	None ..	.....	.....	75	53	70.7
August .....	119	89	74.8	1	1	100.0	None ..	.....	.....	120	90	75.0
September .....	119	96	80.7	11	6	45.5	None ..	.....	.....	180	101	77.7
October .....	251	181	72.1	49	39	79.6	12	9	75.0	312	229	73.4
November .....	241	203	84.2	52	50	96.2	None ..	.....	.....	293	253	86.4
December .....	208	186	89.4	66	60	90.9	None ..	.....	.....	274	246	89.8
1884.												
January .....	241	206	85.3	94	77	81.9	1	1	100.0	336	286	85.1
February .....	176	153	86.9	107	100	93.5	None ..	.....	.....	283	253	89.4
March .....	246	200	81.3	62	54	87.1	3	3	100.0	311	257	82.6
April .....	166	144	86.8	63	52	82.5	None ..	.....	.....	229	196	85.6
May .....	266	197	74.1	58	46	79.3	None ..	.....	.....	324	243	75.0
June .....	89	80	89.9	None ..	.....	.....	None ..	.....	.....	89	80	89.9
Total .....	2,189	1,785	81.1	571	489	85.6	16	13	81.2	2,776	2,287	82.4

Of the total number of cautionary off-shore signals displayed, 534, or 93.5 per cent., were justified as to direction, and 506, or 88.6 per cent., were justified as to velocity. All of the "northwest" signals (16 in number) were justified as to direction.

The abandonment of stations, rendered unavoidable by lack of funds, necessarily interferes with weather prediction. The statutes provide that warnings of the approach of storms shall be given by telegraph, yet the service was left for two months last year without the means for paying the necessary telegraph expenses. As a result, in addition to the reduction in the number of stations, to which attention has already been called, the office was deprived during May and June, 1883, of reports from the Pacific coast. The Western Union Telegraph Company, however, came to our relief and actually performed a large amount of service for which it received no pay and for which it declined making charge.

The great number of "drops" made without cost by this company by recent arrangement has largely increased the benefits of the service to the public by a wider distribution of the information collected.

If the intention is to permit a proper advance in the art of applying meteorological knowledge and laws for the benefit of commerce and agriculture an increase in the number of stations must be provided for, not a diminution. The demands of the country upon the service are increasing every year and should be promptly met.

The capacity of the corps will be devoted, as in the past, to the maintenance of the work of weather predictions, but the success of the office in its work has so increased the labor imposed upon it by the public that the demands for administrative work made upon the number of officers assigned to or belonging to the corps necessarily interferes with the proper attention to scientific investigation.



## BOARDS OF TRADE.

The demand made by the commercial organizations in the various large cities throughout the country for an increase of the information furnished by this service indicates the importance of the work done, and calls for a more liberal support from Congress, that the interests which these organizations represent may not suffer. Committees of the boards of trade, chambers of commerce, &c., appointed to confer with the Chief Signal Officer and the observers in charge of stations suggest improvements in the work of this service, and through these committees frequent calls have been made for data which I have not been able to supply owing to the limited appropriation.

The meteorological committees, distributed as they are in various sections of the country, and representing every branch of trade, are important auxiliaries to this service, and not only are the observers on stations directed to confer with them, but inspecting officers of the service are required to consult them as to the nature of the work done by the observers, and the demands for an increase of usefulness of the service.

## ARCTIC WORK.

The two Arctic expeditions, which were a part of an international series about the pole, in which many governments participated, have terminated. That at Point Barrow under Lieutenant Ray, having been abandoned as directed from this office, arrived at San Francisco, October 7, 1883. Lieutenant Ray's prescribed work during the whole two years has been efficiently performed, in exact accordance with his instructions, and he reports that he had no man sick a single day during the entire period; that their duty there was wholesome and pleasant, and without suffering from cold. His full report will soon be completed.

I will briefly outline the expedition to Lady Franklin Bay.

The general plan received the signature of the President the 28th of April, and the expedition was established by act of Congress approved May 1, 1880.

It contemplated sending one ship with a small party and three years' provisions to be left at their station, and that the ship should then be discharged.

This was to be followed by a supply ship the next season, 1882, and by a relief ship the second summer, and in case it did not reach the station, the party was to establish a depot and quarters for the winter at Littleton Island, with sufficient supplies for both parties, and remain there, and not later than September 1, 1883, Lieutenant Greely, the Arctic commander, with his party, was to begin his retreat, and join them for the winter. This would require sending a ship to Littleton Island the fourth year.

Before Lieutenant Greely's departure from Washington I determined upon a general plan for carrying out this work, after full consultation with him, including a plan for the guidance of two proposed relief expeditions to sail in 1882 and 1883, respectively. His general outfit was the most complete in all respects ever sent into the Arctic seas, and was the result of very careful and comprehensive study.

After arriving at his station, Lieutenant Greely wrote out what he deemed a more complete plan for his relief, and forwarded it to me, earnestly recommending its adoption. In its support he used the follow-

ing language: "Such action, from advice, experience, and observation, seems to me all that can be done to insure our safety. No deviation from these instructions should be permitted." I regarded that plan as authoritative, coming, as it did, from an officer possessing peculiar means of knowledge, charged with the performance of hazardous duties in an almost unknown field of operations, and pre-eminently endowed with the qualifications that should challenge respect for his judgment in such a matter, and it had the weight of being of necessity the prearranged plan, the violation of which on my part nothing could excuse. I still hold that, in view of all probable emergencies, it was the wisest plan that could possibly have been adopted.

The steam-sealer "Neptune" was dispatched in 1882 with a proper relief party and adequate supplies, in charge of Mr. W. M. Beebe, jr., of the General Service of the Army, but failed to reach the station because of impassable ice-barriers. After watching for an opening through the solid ice of Smith's Sound and Kane's Sea until the navigable season in that latitude had nearly closed, and discovering none, the expedition made caches of supplies at the most northerly points of land that it attained and then returned to Saint John's.

The steam sealer "Proteus," of Saint John's, was chartered by me as the relief ship for 1883. That vessel had borne Lieutenant Greely to his station in 1881, and he had afterwards highly commended her and her captain as in all respects well qualified for that duty. The plan of this relief expedition was submitted by me to the Secretary of War for his approval as early as November 1, 1882. In the first paragraph of my letter inclosing the same I wrote as follows: "I have the honor to inclose herewith copy of plan for relief expedition of next year for the Arctic party at Lady Franklin Bay, which plan Lieutenant Greely wished followed in the event of a failure to reach him this year. This seems to leave us only to follow his plans." That plan was returned to me without any dissent as to its essential features, but with the suggestion "that it would be much desirable to endeavor to procure from the Navy the persons who are needed for this relief party." My views as to such suggestion were requested, and as they were furnished I presumed that they were satisfactory, as it was not insisted on. As a measure of precaution the Secretary of War, on my special application, requested the Navy Department to detail a suitable vessel of the Navy to accompany the relief ship as far north as Littleton Island. The steamship "Yantic," Commander Frank Wildes, U. S. Navy, was accordingly assigned to that duty. She was placed in dock and heavily sheathed with oak-planking, and her battery and ordnance stores landed, and it was believed that she was in all respects thoroughly equipped for that special service. In view of the possible destruction of the "Proteus," Commander Wildes was ordered to proceed as far north as practicable, in order to afford succor to her officers and crew in the event of such an accident, and he was directed to proceed northward through Davis Straits, in company with the "Proteus" if practicable, but not to enter the ice-pack or proceed beyond Littleton Island.

Lieut. E. A. Garlington, Seventh Cavalry, U. S. Army, was assigned to the command of the relief party by order of the Secretary of War, he having volunteered, and being recommended as a suitable officer for that service by the general commanding the Department of Dakota, where he had been stationed for several years. Lieutenant Garlington's instructions embodied the plan of Lieutenant Greely, and he was ordered to follow it closely. He was informed that he would be accompanied by a ship of the United States Navy, the "Yantic," as far

as Littleton Island, to render him such aid as might become necessary and as might be determined by the captain of that ship and himself *when on the spot*.

The relief expedition, consisting of those vessels, sailed from Saint John's, in company, on June 29, and voluntarily separated on the same day; the "Proteus" on her arrival at Godhavn being five days in advance of the "Yantic." They were again in company at the last-named point on July 12, and remained together there until July 16, when the "Proteus" again proceeded northward alone, and seven days later was crushed in the ice-pack of Smith's Sound and sunk with nearly all her stores. At the time of the sinking of the "Proteus" off Cape Sabine, on July 23, the "Yantic," that was ordered to be at Littleton Island, if practicable, to meet just such an emergency, the designated reserve ship of the expedition, was distant from Littleton Island more than 1,000 miles.

Lieutenant Garlington, on the day succeeding the wreck, proceeded with the relief party to Life Boat Cove, near Littleton Island, and without halting to await the arrival of his reserve ship, set out at once southward in small boats, carrying off with him full rations for thirty-seven men, for forty days at least, being three-fourths of the provisions saved from the wreck, leaving less than one-fourth cached for Greely and his party of twenty-five at Cape Sabine.

Lieutenant Garlington and party boarded the "Yantic" at Upernavik on September 2. She had arrived at Littleton Island on August 3, only five days after the relief party had left that vicinity, and started southward on the same day, without leaving one ration out of her superabundant stores for Lieutenant Greely and his party. The "Yantic" returned to Saint John's on September 13.

This abandonment of Lieutenant Greely and his party to probable starvation, by officers whose only mission in those waters was to succor them, displayed a lamentable disregard of grave responsibilities.

When the convoy was met it was but three days steaming from Littleton Island, fully stored with supplies out of which ample provision for Lieutenant Greely and the relieving party could have been made, supplemented by those at Cape Sabine and Littleton Island, and it was comparatively in the early season. Yet the convoy did not return to leave succor, nor did the commander of the relief expedition, Lieutenant Garlington, demand it.

Immediately upon the return of the ships to Saint John's this bureau did all in its power to have other ships at once sent from that point, but was unsuccessful, after having been assured that it would be done. It is now almost certain that had any of these steps been taken loss of life and disaster would have been averted, and the cost of a ship from Saint John's last autumn would have been but a small part of the expense of the final relief.

This bureau endeavored to place the relief party upon the theater of action with the best possible ships and equipment, at the most timely season, so that it might be unhampered except by the necessary general plan that both parties must work upon, and with the fullest opportunity and freedom to accomplish its purpose. So far as it was possible this was done.

Lieutenant Greely carried out his instructions literally, as this bureau had also carried out the prearranged plan. Leaving his station within the prescribed time he brought his party, records, and instruments for final comparison, to Cape Sabine, in its retreat without loss, all in sound health and under wholesome discipline.

Landing at Baird Inlet on September 29th, after having been adrift for a month in the ice-pack of Kane's Sea and Smith's Sound, Lieutenant Greely found himself in a desperate condition; he had at that time one boat and about twenty days' rations. Upon the return of two men sent to Cape Sabine he learned of the loss of the "Proteus," and ascertained that some stores were cached in that vicinity. In like manner he found one hundred and fifty pounds of English meat at Cape Isabella. Abandoning the winter quarters which had been built in the mean time he moved his party to Camp Clay, about four miles northwest of Cape Sabine, on the shore of Buchanan Strait, where the cache of stores from the "Proteus" had been made. This point was reached October 15, 1883, when but ten days' sunlight remained. On examining the stores Lieutenant Greely found two hundred and fifty rations in the English cache at Payer Harbor in bad condition (except the beef), and two hundred and fifty rations in good order at the so-called Beebe cache. In the wreck cache left by Lieutenant Garlington were found five hundred rations of bread, about one hundred rations of meat, a few canned vegetables, and a large quantity of tea. At Cape Sabine, abandoned by Captain Pike, was found a quantity of tea and about three hundred pounds of bread. No other provisions of any kind were to be found. Considerable clothing was found cached both at Sabine and Camp Clay, but it had been badly damaged by foxes and bears.

By November 1 winter quarters had been built and all caches and articles gathered at Camp Clay. A hunting party was sent out after seal and camped in Rice's Straits. By November 12 (at which time the sun had been gone seventeen days) the hunting party had returned with two small seals, and the party sent to Isabella for the English meat cached there had been brought back, having been obliged to abandon the meat and the gin in Baird Inlet owing to the complete disability, by freezing, of one of the men. From the 1st of November the party was put on a ration of about fourteen ounces, of which less than five ounces was meat. The plan adopted by Lieutenant Greely contemplated this ration until March 1, when the remaining provisions would give an increased ration for ten days, during which he hoped to reach Littleton Island. At that date his party was still intact, with the exception of one who died of scurvy in January. Lieutenant Greely had, however, learned early in February that Smith's Sound was yet open, a condition of affairs which continued during the entire winter and spring. The ration being reduced still further, four of the party died from insufficient nutriment during the early part of April, while another perished in an attempt to procure the meat abandoned at Baird Inlet the preceding November. Twenty-five foxes and about sixty birds were killed during the winter and spring, which materially assisted in sustaining life. In the middle of the month of April a small bear and young seal were killed, which rendered possible a slightly increased ration and prevented further immediate deaths. About the middle of May the last food was issued, and deaths again commenced. From about the middle of March the ration was supplemented by minute sea shrimps, which were caught in a tidal crack, and later by saxifrage and lichens which, with seal-skin from clothes and sleeping bags, formed the supply of food from the middle of May. By June 18 but seven of the party remained alive, the rest having perished by starvation, except Eskimo Jens Edward, who was drowned, and Private Henry, who was executed by order of Lieutenant Greely for repeated thefts of food. From the middle of April Lieutenant Greely's party looked with long-

ing hope towards Littleton Island, trusting that relief would come from that quarter. From that time forward a broad channel, free from ice, existed in Smith's Sound, which could have been crossed by strong men, but was utterly impassable for Lieutenant Greely's party, enfeebled and diminished as it was by months of starvation.

Preparations for the rescue this season were timely, the plan being carefully elaborated by a board of officers of the Army and Navy, at which the Chief Signal Officer presided. The expedition sailed from New York in three ships, the "Thetis," "Bear," and "Alert," the latter having been given to the United States by the Queen of England for the purpose, about the 1st of May, under Commander W. S. Schley, of the Navy, reaching Cape Sabine the 22d of June, effecting the rescue of the seven survivors, and returning to the United States, reaching Portsmouth, N. H., the 1st day of August, and, with the exception of weakness, all in good health. Sergeant Ellison, who was frozen in an attempt to secure the provisions cached at Isabella, died on the home passage, July 6, after suffering amputation of all his limbs. The work of rescue under Commander Schley was most praiseworthy and successful.

Up to the return of the expedition this year I had hoped there would be no occasion for raising the question of blame at this or any future time. But new light has been cast upon the subject, and with it my duty becomes plain, and the truth of history, and justice to all, calls for such impartial inquiry and authoritative judgment as a tribunal broad enough to embrace the whole question shall institute and pronounce, and the Congress of the United States is manifestly such tribunal.

The International Polar Expedition was organized and set in motion by the direct order of the President of the United States, pursuant to the authority vested in him by an act of Congress. Its progress and achievements have commanded the attention and challenged the admiration of foreign countries, and reflected new luster upon our own.

The magnitude of those achievements has only been paralleled by the disaster in which it terminated. That such disaster could have been averted, and that it was in no respect due to the commander of that expedition, can be established by indubitable evidence. The causes that co-operated to produce a tragedy that has appalled the civilized world, and the responsibility for such dire result, can be traced with certainty.

I therefore trust that this whole matter of the Lady Franklin Bay Expedition, and the expeditions organized for its relief, will be deemed worthy of a thorough investigation by Congress—a body that will perform its duty, and stand above the suspicion of being swayed by partisan considerations.

This expedition will stand among the foremost of its kind. It carried its work farther north than any other. It gained detailed geographical knowledge of greater breadth in that region than any other. It brought back more complete data upon physical problems than any other. It dispelled the myths and superstitions of Arctic living, and completed in a masterly way all the services it was sent to do, in the exact manner prearranged, and, having made a clear addition to the sum of human knowledge, returned to the place of rendezvous intact and perfect, and it is proper that the fault of failure afterwards be fully understood. Both Lieutenant Greely, in the Arctic, and the Signal Bureau, in Washington, carried out their parts of the pre-arranged plan of rescue literally and successfully in every particular.

This plan seemed to be a good one and Lieutenant Greely reiterated it after reaching his station and seeing what he wanted, and it proved to be good.

The sinking of the "Proteus," which terminated this success, which to that time was complete and faultless, was an accident for which there may or may not have been blame. But means to substantially restore the losses so incurred had been provided and were at hand. The "Proteus" was the best ship with the best captain for the purpose to be had, both being the same employed by Lieutenant Greely in 1881, and she was very perfectly supplied and well equipped. She was sent at the exact season then believed to be the best for the fullest chances of success, and she was accustomed to Arctic navigation. But when she sank the full responsibility for what followed rested with those on the spot, and it becomes necessary, in the fuller lights, to discuss it, that censure may not be misplaced. Besides the duty that necessarily reposed in the commander present, Lieutenant Garlington's orders read: "A ship of the United States Navy, the 'Yantic,' will accompany you as far as Littleton Island, rendering you such aid as may become necessary and as may be determined by the captain of that ship and yourself, when on the spot." This was all any commander so situated, imbued with a just appreciation of his duties and responsibilities, could wish.

Lieutenant Garlington failed when at Cape Sabine, July 22, to replace the spoiled parts of the cache of food previously left at Cape Sabine, as he was ordered in his instructions to do. Lieutenant Greely says of this, in a letter written by him for the Chief Signal Officer, April 30, supposing himself at the point of death: "had Lieutenant Garlington carried out your orders and replaced the 240 rations rum and 120 alcohol in English cache here, and the 210 pounds moldy English bread, spoiled English chocolate and potatoes, melted sugar, and the 210 pounds rotten dog biscuit we would without doubt be saved." Lieutenant Garlington saved from the wreck about 2,100 rations, they being but a part of those put upon the ice and could have been saved, which he landed at Cape Sabine. These rations for Lieutenant Greely's party were priceless, they were worth many human lives. Of these rations he left for them about one-fourth part, and of this but about 150 pounds of meat, taking the remainder away in his boats for his own use; seeming only to limit the quantity taken by the capacity of his boats, when his men were strong and well, in the summer season, had suffered no hardships, were abundantly supplied with guns and ammunition, in a region full of game and walrus, in the neighborhood of the friendly Esquimaux, and with their faces set towards plenty. A proper appreciation of a sacred duty and of his obligation to his trust and to Lieutenant Greely would have shown him that two-thirds of these stores ought to have been left, and had this been done Lieutenant Greely says his party "would all have been saved." With one-third of the rations taken away and other resources at hand, the retreating party would have been reasonably safe. Besides, the food improvidently used and wasted, used for fuel, used to feed to repletion a dog, and left to waste in camps, would have saved human lives at Camp Olay.

On reaching Littleton Island it was found that its shores were literally lined with walrus, while there were in the hands of the party fifteen guns and some four or five thousand rounds of ammunition; a better supply than any expedition ever before had in those regions.

There is scarcely any room for doubt that in a few days the party

could have killed and packed in the snow, as is often done with fresh meat in Dakota, walrus meat enough with stores in caches in the vicinity, and saved from the "Proteus," to have supplied the combined party of Lieutenants Garlington and Greely a wholesome and abundant ration for a year.

Lieutenant Ray says that at Point Barrow, under like circumstances, his party killed walrus enough in one day to have supplied his party a year.

Lieutenant Garlington reports that he left Littleton Island with his party for the south for the purpose of finding the escort ship and returning with it with supplies for Lieutenant Greely. But when he did reach it, only three days steaming away from Littleton Island, he made no demand to her captain for her return, while she had on board, as also had Governor Elborg at Upernavik, ample food available for this purpose.

The order of the Secretary of the Navy to the captain of the escort ship gave him latitude to remain at Littleton Island until near the close of the season, about September 30th; yet with a full knowledge of the distressing condition Lieutenant Greely would find himself in, and the whole plan of his rescue being familiar to him, he turned southward at once, a month earlier than required by the season, leaving nothing for Lieutenant Greely, and so intent was he to get south that he appears to have had the intention of leaving Lieutenant Garlington's party behind if not found in his path. The tone of this officer's utterances upon these subjects have impressed me with a want of efficient effort or intent on his part to perform his duties, disqualifying him for their loyal performance.

No language could be more just, and yet more severe, than that addressed by the Secretary of the Navy to Commander Wildes, after that officer had written a supplementary report to justify his conduct. I beg leave to cite the letter of the Secretary of the Navy, as follows:

NAVY DEPARTMENT,  
Washington, November 2, 1883.

The receipt of your letter of October 16 is acknowledged. In the present aspect of the case the department condemns (1) the agreement inclosed in your letter of June 25 between Lieutenant Garlington and yourself contemplating the separation of the "Yantic" and the "Proteus" until August 25; (2) your failure to accompany the "Proteus" from Disco Island after you had there rejoined her; (3) your unnecessary visit to Upernavik on July 25 to inquire of the Danish authorities how the ice was probably moving between yourself and the "Proteus," the six days of your delay at which point would have brought you to Littleton Island before the party of the "Proteus" went south; and (4) your failure, when you found at Littleton Island that the demoralized party of the "Proteus" had gone south in search of the Swedish steamer "Sofa" at Cape York, to land materials for a habitation, clothing, and some food for the forgotten Greely party. What action, if any, will be taken by the department has not yet been determined.

Very respectfully,

WM. E. CHANDLER,  
Secretary of the Navy.

Commander FRANK WILDES, U. S. Navy,  
Commander U. S. S. "Yantic," Navy Yard, New York.

On the return of the escort ship, bringing the relief party to Saint John's, September 13, there was still time, as known from previous experience and shown by subsequent facts, to send effective relief, and my six telegrams from Washington Territory, where I then happened to be, attest the earnestness of my efforts to have this done. Besides this, Captain Melville and others volunteered to go, giving their full plans for the relief.

There is scarcely a doubt had any one of these five means I have pointed out been availed of, the untold sufferings at Camp Clay last winter would have been prevented and the entire party saved.

**NOTE.**—At no time after reaching Cape Sabine could Lieutenant Greely's party have crossed Smith's Sound to Littleton Island. While his men were strong the current was so swift, and so filled with masses of drifting ice, that there was not the slightest prospect of success, and any attempt could have ended only in drifting helplessly on some ice-floe, a condition from which, after thirty days, the party had just been rescued.

At Carey Islands, directly in Lieutenant Garlington's path, 100 miles south of Cape Sabine, there were 1,800 rations in the Nares cache in good condition, which he had inspected but six days previously. This made it unnecessary to take from Lieutenant Greely's stores at Cape Sabine more than four days' rations for his own party. This would have left for Lieutenant Greely 1,900 rations at Cape Sabine, and placed his safety beyond question.

#### SCIENTIFIC WORK.

I am pleased to acknowledge the courtesy of the following-named scientists who have responded to requests for information upon subjects under investigation by this bureau, viz:

On atmospheric electricity, Prof. H. A. Rowland, of Baltimore, and John Trowbridge, of Cambridge.

On atmospheric spectroscopy, Prof. C. S. Hastings, of Baltimore, Prof. S. C. Pickering, of Cambridge, Prof. W. Upton, of Providence, and Prof. C. S. Cook, of Hanover.

On barometry, Prof. A. W. Wright, of New Haven.

On chemical analyses of the air, Prof. E. W. Morley.

On earth temperatures, Prof. T. C. Mendenhall and Prof. Trowbridge.

On bibliography, numerous meteorologists, among whom may be mentioned Dr. George Neumayer, Dr. George Hellman, Dr. A. Lancaster, Dr. F. B. Hough, Prof. Elias Loomis, from each of whom valuable assistance has been received. It is specially gratifying to be able to add that the latter has consented to compile a summary of the results embodied in his twenty memoirs, entitled "Contributions to Meteorology," with much additional matter for publication as a professional paper. These laborious studies of Signal Service tri-daily weather maps cannot but prove of value to the science.

Prof. Cleveland Abbe, assistant, has continued in charge of the Study Room, and the work assigned to that division has been carried forward with gratifying results.

#### STANDARDS.

Extensive investigations have been made with a view of determining the most reliable methods of exposure of thermometers, and from the preliminary results thus obtained the office has improved its exposure of instruments at a number of stations.

**Barometers.**—The work of comparing the Signal Service standard with foreign standards has been continued, and the experiments looking to the construction of a normal barometer have resulted satisfactorily, and I have ordered a duplicate of the normal barometer for use in the Signal Service.



Sample anemometers used by the Signal Service have been compared with anemometers of foreign services, with a view of determining the possible errors in the wind records of this service.

Rain-gauges of several varieties have been accurately compared for the purpose of determining the effect of exposure, wind velocity, and diameter of gauge upon the measured rainfall, and, if possible, to ascertain the law of variation of rainfall with altitude.

The necessity of accurate time at the various signal stations has been enforced by scientists engaged in the study of earth currents and electricity. The standard clock will be improved, and, if possible, arrangements will be made which will secure to the principal stations of the service correct time for observations.

Tables for the derivation of dew-point and humidity, based on Rignault's formula for the psychrometer, have been extended, and new tables will be computed as soon as the formula has been modified so as to agree with recent data obtained by this service from stations at Pike's Peak and Yuma.

The table of constants for reduction of barometer to sea-level continues in use, and this plan gives good, although not satisfactory results. It is hoped that some action may soon be taken by the meteorological service of the world which will lead to a uniform method of reductions of barometer readings to sea-level.

The system of study and observations of atmospheric electricity inaugurated in August, 1882, under the direction of Professors Rowland and Trowbridge has continued, and satisfactory progress reported.

By a careful investigation of this subject it is possible that a new and important element may be added to the regular tri-daily reports upon which are based the weather forecasts and storm warnings of the service.

At the request of the International Congress of Electricians, the Signal Service has undertaken to stimulate a general interest in the subject of electrical investigation and to secure the co-operation of professional electricians of telegraph and telephone companies in the work of distributing information collected by the Signal Service for the benefit of the public.

Several telephone companies are at present co-operating with this service in this important work.

*Solar radiation.*—By the recent studies of Professor Ferrel, of this service, a decided advance has been made in our knowledge of the requirements of a standard actinometer, and I have approved the plans submitted for the construction of such standard instruments.

Special study has been made of conditions attending the development of tornadoes, with a view, if possible, of adding warnings of the approach of these destructive storms to the regular weather forecasts of the service, but, at present, the results of these investigations do not justify an attempt on the part of this office to forecast the occurrence of tornadoes within a limited area, while the general conditions accompanying tornadoes may be announced with sufficient accuracy as to justify the prediction of violent local storms in threatened meteorological districts. This investigation will be continued.

The international agreement, by virtue of which each civilized nation has contributed its share towards meteorological and magnetic observations in the Arctic and Antarctic regions, has been complied with, and the data obtained from the stations established by the United States are being prepared for publication. It is confidently expected that the results obtained from the united action on the part of countries will

prove of practical value in the preparation of weather forecasts in the future.

The detailed report of the work performed in the Study Room of this office is given in Appendix No. 4.

#### TELEGRAPH LINES.

The military telegraph lines built and operated by the Signal Service in the unsettled portions of country have not only proved of great service in operations, but they have added much to the accuracy of the Signal Service predictions and storm warnings. It is the policy of this service to discontinue these lines as soon as the commercial lines take their place, and during the year 112 miles of line were abandoned.

The lines at present operated are distributed as follows:

	Miles.
California and Arizona Division .....	510
Department of the Missouri .....	693
Northwestern Division .....	893
Texas Division .....	197
Washington and Idaho .....	500
San Francisco harbor .....	12

The total number of miles in operation at the end of the year was 2,805 miles. The total line receipts during the year were \$39,003.76.

As anticipated in last year's report, the withdrawal of detailed men of the line of the Army from permanent duty with the military telegraph lines as operators and repairers, and the small force of Signal Corps men available for such duties, have seriously embarrassed this office in maintaining some of the more isolated sections in a proper state of efficiency. While such temporary assistance as is permitted under the provisions of General Orders No. 3 of 1884, Adjutant-General's Office, has usually been given freely by department and post commanders, yet, men thus temporarily detailed for a few days only, and without additional pay for such extra labor, could not be expected to do as efficient and lasting work as men permanently detailed, fitted by experience, and receiving just compensation, would have performed. Besides, the delay occasioned in applying for and getting ready a detail to start out on the line when a break occurred occasioned at times interruptions of much longer duration than would have been the case had there been permanent repairmen, ready to mount and start out at a moment's notice. Another point is to be considered in this connection. On some of the lines in Texas, New Mexico, and Montana it is almost impossible to hire labor when the operator is unable to make proper repairs alone; or, if labor can be had, the price asked is so excessive that the means at the command of this office will not permit its payment, so that either the repairs have to be made poorly by one man or the line has to remain open until the commanding officer at the nearest post can furnish a detail.

In view of the foregoing, it is recommended that a law be secured permitting the permanent detail of fifty enlisted men from the line of the Army for duty with the military lines, and payment of extra-duty pay to the same from line receipts, as in former years. It will be seen that the line receipts are now \$14,000 in excess of the appropriation for their support.

In the California and Arizona division forty-seven miles were abandoned as no longer necessary for military purposes.

In the Department of the Missouri the short, isolated sections, connecting military posts with commercial offices, were equipped as tele-

phone lines, and the larger lines, connecting two or more posts, continued to be operated as telegraph lines under the direction of post commanders. The lines from Gunnison to Uncompahgre, eighty-one miles, and from Rawlins to camps on White River, one hundred and forty-four miles, abandoned during the previous year, were sold at auction under authority from the Secretary of War.

The military lines in the Texas Division have, since the relief of the signal officer in charge, December 31, 1883, been under the immediate charge of an officer in this office. The extensive abandonment of lines in this division during the preceding year left but two hundred and sixty-two miles in operation at the beginning of the present fiscal year, and this was still further reduced by the abandonment, on September 5, of the line from Fort Concho to Coleman, sixty-five miles. Of the lines abandoned during the preceding and current years only eighty-eight miles of one section were retained and the remaining nine hundred and twenty miles were sold at auction by authority of the Secretary of War.

Five hundred miles of military telegraph lines were operated in the Washington and Idaho Division. The station at Tatoosh Island was connected by cable, two miles in length, with the land line terminating at Cape Flattery. A second cable, four miles in length, was laid across the mouth of the Columbia River, on October 10th, joining part of the military telegraph line, connecting Astoria with Fort Stevens. The points reached by these cables are of special value to the system of Signal Service reports intended for the Pacific coast weather service.

The necessary cables to complete the telegraphic connection of the military posts in San Francisco Harbor have been successfully laid during the year. In making these connections  $4\frac{1}{2}$  miles of cable and  $7\frac{1}{2}$  miles of line were required.

In the northwestern division there remain 893 miles of telegraph line in operation after the sale of 1,061 miles of abandoned lines. That portion of this line which extends to the north of the North Pacific railroad should be kept in repair, as meteorological reports from stations on that portion of the line are of especial value in determining the advance of cold waves which are likely to be attended by damaging frosts.

The sea-coast telegraph line, extending along the coasts of New Jersey, Delaware, Maryland, Virginia, and North Carolina, is of great value to shipping, and, as a means of rapid communication, when assistance may be required, has, as in the past, proved valuable to the Signal Service and to the commercial interests of the country. The importance of maintaining this line and extending it along the entire Atlantic coast, where it may be practicable, cannot be well overestimated. The service has been able in past years to save from destruction and loss vessels and property the value of which exceeded the entire cost of maintaining the Signal Service. The signal stations along the coast line are manned by observers versed in the use of marine signals, and, being in connection with this office, are able to communicate to passing vessels the weather conditions as given from the central office. This is an important branch of the Signal Service work, and I earnestly recommend that an appropriation of \$39,000 be made for the purpose of extending this line and placing the present part in thorough repair.

The appropriation for a cable to connect Martha's Vineyard with the main-land, being but one-half the original estimated cost of cable, it will not be possible to establish continuous and reliable connection with the main-land with the fund available.

## INSTRUMENTS.

In the Meteorological Observatory of this office one thousand and sixty instruments were carefully compared with the standards, and instrumental error determined for each instrument. Six hundred and thirty-three instruments have been purchased, one hundred\*and ten manufactured and repaired, and one thousand and ninety-one instruments were returned from stations broken or for repairs. Six hundred and four instruments were issued to regular Signal Service stations, one hundred and twenty-one were issued to cotton-belt stations, and two hundred and thirty-three were examined and compared for private parties.

During the year a standard thermometer for low temperatures has been established by very careful and repeated comparisons of two fine Berlin thermometers with the air thermometer, and the results show that the calibration agrees well with the air thermometers. A series of comparisons of the air thermometers have also been made with the mercurial thermometer, and the results are being prepared for publication. A careful series of comparisons have also been made between six new Fuess barometers and the Adie standards, numbers 1526 and 1555, at this office, and the Green standard, number 1879. The results of these comparisons show that the standard barometer at Saint Petersburg is 0.014 lower than the Kew standard. The report of Junior Professor T. Russell, of the Signal Service, on the subject of comparison of instruments is given in Appendix No. 6.

## STATIONS.

The number of stations in operation June 30, 1884, in the United States was four hundred and sixty-four. These include the telegraph stations, printing stations, display, special-river, cotton-region, and sunset stations. This shows an increase during the year of eighty-eight stations. In addition reports are received from twelve Canadian stations by the coöperation of the Canadian Meteorological Service.

Telegraphic reports are received at this office, daily, from one hundred and forty-seven stations.

During the year seven full reporting stations have been established and five discontinued.

The system of simultaneous reports taken by foreign observers has continued, and special effort has been made through the marine division of this office to induce captains of vessels to coöperate in this work, as by means of these reports valuable studies are made of storm movements after the center of disturbance has passed beyond the limits of land stations.

The total number of reports received from land stations is five hundred and forty-seven.

The total number of vessels reporting during the year is six hundred and fifty-nine.

In the collection of data for the purpose of studying ocean meteorology, this office is indebted to the New York Herald for the use of marine reports collected by that journal.

The total number of voluntary observers in the United States who have forwarded monthly reports to the Chief Signal Officer is three hundred and sixty-two.

The number of military posts sending observations is sixty-three.

Numerous requests have been made for the establishment of signal

stations throughout the country, but the reduced appropriations have prevented the Chief Signal Officer from complying with these requests.

The work of the service could be made more valuable by an increase of stations, especially in the regions west of the Mississippi River and on the Pacific coast.

With the addition of fifteen stations the value of the weather predictions of this service would be greatly increased.

#### PACIFIC COAST WEATHER SERVICE.

I again call attention to the necessity of a separate office, under charge of an instructed officer, on the Pacific coast. The weather conditions there differ so markedly from those observed in other sections of the country that special study by an officer on that coast is required, in order that the citizens of that section of the country may receive the full benefits of the Signal Service reports. It is now my intention to assign an officer to duty at San Francisco the coming autumn, to take charge of this important work.

#### STATE WEATHER SERVICE.

The State meteorological services previously established, and co-operating with the Signal Service, have continued in operation, and excellent services have been added during the year in Alabama, Louisiana, and Minnesota, and efforts are being made to extend this service in other States.

Local services are now in operation in thirteen States, and I find that these organizations enable the Signal Service to distribute promptly in threatened districts general warning of approach of frosts, "northers," cold waves, and dangerous storms, with comparatively little expense.

These local services will bring the benefits of the Signal Service to the people of every county of the State in which they are properly organized. They will make it possible for this service to organize a system of storm signals to be displayed from railway trains for the benefit of those interested in agriculture.

The report of the assistant, who has had charge of the organization of these services, will be found in Appendix No. 7.

#### MISCELLANEOUS.

The railway weather signals have continued on three lines in Ohio with gratifying results, and it is probable that these signals will be carried by other roads in that State during the coming year. These signals have also been displayed over the Cumberland Valley Railroad and the Frederick division of the Pennsylvania Railroad during the year, and special signals, indicating the character of the weather, have recently been adopted and are now in operation on the principal railroads in Alabama, under the direction of the chief of the Alabama weather service.

The Louisiana weather service has also arranged for the display of frost signals on railroads passing through the sugar region of that State. The information upon which all these signals are displayed is telegraphed from this office.

A system of river reports, by means of which this office is enabled to give timely warning of the rise and fall of rivers and the approach of dangerous floods, has been continued, and will be greatly extended and improved during the current year, as a special appropriation has been made with this in view.

The system of flood-warnings at Chattanooga has been perfected, and is highly commended by the citizens of that locality as a valuable service. (See Appendix No. 8.)

Special reports for the benefit of the cotton interests, the frost-warnings to fruit and tobacco growers, and the announcement of the approach of "northers," have been continued.

The Farmers' Bulletins and the Railway Bulletins are still distributed, and a new feature has been added to the former, by means of which special notice is given of the approach of cold waves. As these bulletins are displayed at more than eight thousand post-offices, and as many post-masters have provided themselves with flags, which, when displayed, indicate the approach of a cold wave, it is believed that much benefit will result from the information thus conveyed.

As an illustration of the value of Signal Service reports to the medical profession I will invite attention to the series of charts prepared at the request of the Colorado State Medical Society. These charts exhibit, graphically, the average cloudiness and the average weight of vapor contained in a cubic foot of air, or the absolute humidity, during each season of the year in the various sections of the country. Appendix No. 9 contains a report with the charts above mentioned.

#### PERSONNEL.

The work of the service is done by twenty officers and 500 enlisted men. The men are distributed as follows: At the Office of the Chief Signal Officer are 181; on telegraph lines, 106; at Fort Myer, 41; on station, 163. The others are on leave for sickness or other causes. Five of these officers are now at the school of instruction at Fort Myer, leaving but fifteen for the work of the Signal Service, a less number than at any time previous for years.

#### PROPERTY AND DISBURSEMENTS.

The methods of administering the duties of the Property and Disbursing Division of the office have been much improved, every advantage being taken of a possible opportunity to decrease the labor and at the same time to maintain the efficiency and accuracy of the work.

Advantage has also been taken of the experience of years to perfect a system of accountability for public money and property which would admit of no adverse criticism, and at this time there is nothing to suggest in the way of improvement.

The methods of verifying and settling accounts in this bureau are those prescribed by the Army Regulations, and are identical with those which govern in the Quartermaster's Department. The same auditor and comptroller who examine the accounts of all quartermasters, examine the accounts of the disbursing officer of this office.

By a judicious economy the most efficient service which the curtailed appropriations would admit of has been obtained, and I append a report of the condition of the appropriations for the fiscal year end-

ing June 30, 1884, with expenditures thereunder, and balances unexpended at the end of the year, with probable demands on such balances, as required by act of Congress, approved May 1, 1829.

#### PUBLICATIONS.

The Monthly Weather Review has been improved during the year by the addition of a large chart, which now makes it possible to trace a storm on a single chart from the Pacific coast to the east portion of the north Atlantic Ocean.

This publication contains a careful summary of the meteorological conditions occurring during the month, each meteorological element being treated separately.

It also contains extracts from bulletins issued by the local State service. In previous years these reviews have been republished as a part of the Annual Report of the Chief Signal Officer, but the edition of 2,500 now issued will doubtless satisfy the demand, and I have therefore discontinued its publication.

The Monthly Summary and Review treats specially of international meteorology, and is based upon the 7 a. m. simultaneous report which is made by co-operating observers and published daily at this office as the International Bulletin.

The work of preparing for publication the Meteorological Record has been continued and several volumes are now ready for the printer. The value of this work to those wishing to study meteorology cannot be overestimated, and great care has been taken to guard against errors.

Professional Paper No. XIII, "Temperature of the Atmosphere and the Earth's Surface," by Prof. Wm. Ferrel. The general subject of this paper is treated under the following four subdivisions: 1. The relative distribution and the variations of solar radiation; 2. Conditions determining temperature; 3. Actinometry; 4. The distribution and variations of temperature. This is a paper of original research, comprising sixty-nine quarto pages, in which the principles, methods, and results are for the most part entirely new. In general, only so much of what was already known on the different branches of the subject has been introduced as was necessary in the further prosecution of research on the subjects. From the general formulæ and principles, however, although entirely new, taken in the fullest and most general extent of their applications, many results have been deduced which are not claimed to be new.

A volume is also in a forward state of preparation by the same author, intended to comprise the best and most useful parts of all scientific papers which have been published, systematically arranged so as to form a treatise on the "Progress and recent advancements of the higher Meteorology." In this treatise will be comprised whatever is considered most appropriate and important in the various meteorological papers of original research and others by different authors and published in different parts of the world, the simpler parts of the paper on "The Temperature of the Atmosphere and the Earth's Surface," and of the several parts of the "Meteorological Researches" published by the Coast and Geodetic Survey, but all presented by more popular methods, better adapted to learners than the methods in the original papers, in which it was generally supposed that the reader was familiar with what had been already published on the subjects.

Professional Paper No. VII, "Report on the Character of Six Hun-

dred Tornadoes," by Sergeant J. P. Finley, Signal Corps, U. S. Army, has been revised and republished.

The following Signal Service Notes have been issued during the year :

Signal Service Note No. X, "Report on Lady Franklin Bay Expedition of 1883," by Ernest A. Garlington, first lieutenant, Seventh Cavalry, Acting Signal Officer.

Signal Service Note No. XI, "The Elements of the Heliograph," by Frederick K. Ward, first lieutenant, First Cavalry, Acting Signal Officer,

Signal Service Note No. XII, "The Special Characteristics of Tornadoes, with Practical Directions for the Protection of Life and Property," by Sergeant J. P. Finley, Signal Corps, U. S. Army.

There has also been published during the year "The Danger, Distress, and Storm Signal Code," intended for the use of Signal Service sea-coast stations and mariners. This publication contains all the messages of the International Code likely to be used by vessels desiring to communicate near the coast, with brief directions for using the code, and in addition a new storm-signal code which will make it possible for any vessel passing within range of a signal station to receive weather indications or storm warnings by means of the signals used in the International Code.

With a well-equipped sea-coast line this weather code will prove a great service to the shipping interests of the country.

#### NOTES.

The post of Fort Myer, maintained as a recruiting station and school of instruction for officers and men of the Signal Corps, is being steadily improved as the very limited means available will permit, and it is hoped that it will become, in a few years, in every way creditable to the service.

A new office-building, adapted to the wants of the service, is imperatively needed, both for economical work and for the safety of the invaluable records of data accumulated in fourteen years of observation, now jeopardized by being stored in insecure buildings. Drawings and estimates are now on file in the office of the Secretary of War, with letters fully setting forth these facts.

A completed organization for the Signal Corps is of the greatest importance. By retaining the experience of officers who have served for long periods in this service great economies can be secured each year, serious mistakes can be avoided and excellence of service can be obtained in no other way.

The following plan is submitted, and is now believed to be all that is required :

#### LEGISLATION NEEDED BY THE SIGNAL SERVICE.

To be added to the Signal Corps, with the rank and pay of officers of like grade of cavalry :

1. One colonel.
2. One lieutenant-colonel.
3. One major and disbursing officer.
4. Eight captains; and the second lieutenants of the Signal Corps, after eight years of service as second lieutenants, may be appointed by the President, first lieutenants; and after fourteen years' service as lieutenants, may be appointed, by the President, captains. And the



one hundred and fifty sergeants of the Signal Corps shall be composed of three classes, twenty-five of the first class, who shall have the pay proper of \$50 a month; fifty of the second class, who shall have the pay proper of \$40 a month; and seventy-five of the third class, who shall have the pay proper of \$34 a month, the same as now; and all the sergeants, corporals, and privates of the first class of the Signal Corps shall be known as "observers of the signal service."

I am, sir, very respectfully, your obedient servant,

W. B. HAZEN,

*Brig. and Bvt. Maj. Gen'l, Chief Signal Officer, U. S. Army.*

Hon. ROBERT T. LINCOLN,  
*Secretary of War.*

## APPENDIX No. 1.

### STANDING ORDERS FOR THE SIGNAL SERVICE SCHOOL OF INSTRUCTION AND THE POST OF FORT MYER.

INSTRUCTIONS }  
No. 97. }

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington, August 15, 1884.

The following compendium of orders and instructions governing the Signal Service school of instruction for officers and enlisted men, and the post of Fort Myer, Virginia, replaces that published by Instructions No. 20, from this office, series 1883; it will be inserted in the "Office Regulations" after paragraph 580. The officer in charge at Fort Myer will see that these instructions are literally carried out.

W. B. HAZEN,  
Brig. & Bvt. Maj. Gen'l, Chief Signal Officer, U. S. A.

#### OFFICIAL:

B. M. PURSELL,  
2d Lieutenant, Signal Corps, U. S. Army.

### CHAPTER XXIII.—STANDING ORDERS FOR THE SIGNAL SERVICE SCHOOL OF INSTRUCTION AND THE POST OF FORT MYER, VIRGINIA.

#### GENERAL INSTRUCTIONS.

581. Fort Myer, Virginia, is maintained as a Signal Service school of instruction. (Ins. 106, 1882.)

582. The Chief Signal Officer is in immediate command of the post. During his absence beyond post limits, the senior officer present will assume the duties of officer in charge. (Ins. 31, 1883.)

583. Fort Myer will be maintained as a first-class station whenever a class is under instruction, at other times as a third-class station. (Ins. 74, 1883.)

584. The enlisted men under training will be known as "men under instruction." The enlisted men not under instruction, but necessary to the maintenance of the post, will be known as the "permanent party." (Ins. 106, 1882.)

585. The Articles of War will be read to each recruit within six days after his arrival at the post; also to the entire command every six months. (Letter, Feb. 14, 1884.)

586. A copy of the "Hand-book for the Signal Corps" will be issued by the officer in charge to each enlisted man, not already supplied, joining the station (the permanent party excepted). This book is to be accounted for on discharge by delivery to the sergeant or other enlisted men left in charge of the station where the order for discharge is received. Enlisted men, though not required to commit the entire text of the "Hand-book" to memory, will thoroughly familiarize themselves with its contents. (G. O. 41, 1884.)

587. The post-quartermaster will assume the same personal detailed control and management of quartermaster's duties and work as is usual at military posts, and shall be subjected to the same responsibilities. (Letter, March 27, 1882.)

588. No renter, or other person on the Arlington estate, will dispose of any hay, straw, fodder, or manure, so that it will be deposited off from that property. (Letter, April 26, 1882.)

589. No private service will be rendered by persons in the public employ excepting the proper furnishing of necessary supplies, which is usual in the military service; and such work as may be done with the free consent of the persons doing it, in their own time, as is customary in the military service, and for which they will be paid, as may be arranged between the parties. (Letter, March 22, 1882.)

#### DRILLS.

590. Men under instruction will be drilled twice daily (see par. 612), an hour at a time, every Monday, Tuesday, Wednesday, Thursday, and Friday, excepting holi-

days. During inclement or excessively hot weather drills will take place in barracks. (Ins. 106, 1882.)

591. All drills will be superintended by a commissioned officer, who will be present at drill, and, when squads are assembled, will drill in person. There will be a rest of five minutes after each period of exercise of twenty minutes, and at no other time. (Ins. 106, 1882.)

592. The greatest attention will be paid to the "setting up" of the men under instruction, and the rigor applied to it at the Military Academy at West Point will in no case be abated. The utmost courtesy and fair treatment will be extended to all under instruction. (Ins. 106, 1882.)

593. Squads of recruits, as soon as they report, shall be formed for signal drill, twice a day (see par. 612), under the best available sergeants, to be overlooked by an officer. (Letter, July 6, 1882.)

594. A neat and soldierly habit and carriage will be, at all times, practiced, and the officer in charge will promptly correct any violation of this, either by enlisted men or officers.

595. The permanent party will receive such drills and instruction, under direction of the officer in charge, as is usual for garrison troops. (Ins. 106, 1882.)

596. Drills for men under instruction:

*School of the Soldier (dismounted).*—Twelve weeks; to page 73, Cavalry Tactics.

*School of the Company (dismounted).*—Four weeks; page 73 to page 113, Cavalry Tactics.

*School of the Platoon.*—Four weeks; page 173 to page 202, Cavalry Tactics.

In place of three drills, three lessons in learning by heart and reciting pages 402 to 409, inclusive, of Cavalry Tactics. In place of each fourth drill of all the above, there will be recitations upon the drill indicated. The number of men in squads will in no case be in excess of that described by the tactics. In all drills, the maximum of time will be devoted to instruction and exercises, and the minimum will be devoted to marching. The officer of the day will be present at and supervise all roll-calls and formations for duty, and will be responsible for their proper performance, and will state in the guard report that he has done so. (Ins. 106, 1882.)

#### CALLS.

597. Calls will be sounded as follows:

Reveille, 1st call.....	5.15 a. m.
Reveille.....	5.25
Assembly.....	5.30
Breakfast.....	5.40
Stable call.....	6.00
Drill (1st call, 6.30 a. m.).....	6.35
Fatigue call.....	7.00
Sick call.....	7.30
Recall from drill.....	7.35
Guard-mounting (1st call, 7.40 a. m.).....	7.45
School call.....	8.00
Recall from fatigue and school.....	12.00 m.
Dinner immediately after recall from fatigue.	
School call.....	1.00 p. m.
Fatigue call.....	2.00
Recall from school.....	4.00
Drill (1st call, 4.10 p. m.).....	4.20
Recall from drill.....	5.20
Stable call.....	5.30
Recall from fatigue.....	6.00
Supper immediately after recall from fatigue.	
Retreat, 1st call, 10 minutes before sunset.	
Assembly, 2 minutes before sunset.	
School call immediately after retreat.	
Tattoo, first call.....	9.00
Tattoo.....	9.10
Assembly.....	9.15
Extinguish lights.....	9.30

#### Sundays.

Inspection (1st call, 8.20 a. m.)..... 8.30 a. m.  
Guard-mounting immediately after inspection.

All other calls, excepting for drill, fatigue, and school, the same as on other days.

Evening school will be from retreat until tattoo, and the men under instruction will continue at their studies during that time.

For the winter months fatigue call will be at 8 a. m. and 1 p. m., and recall at 12m. and 4.30 p. m.

#### GUARD DUTY.

598. Men under instruction will perform guard duty, but after two months' service they will be relieved at tattoo. They will not be subject to ordinary fatigue duty, and will be given no special or general duty interfering with the drills and hours prescribed for study and school exercises (except as per par. 612.) (Ins. 106, 1882.)

599. After the first two months of guard duty men under instruction will be relieved from guard after guard-mounting, and will then repair to their quarters for study and exercises during study hours. The guard-house during this time will be left in charge of the corporal of the guard, who will continue his studies there. The corporal of the guard will not be excused from lectures or instruction. When released from quarters the men will repair to the guard-house for guard duty. Three men of the permanent party will be turned off with the guard during this time as supernumeraries; they will be dismissed after guard-mounting to their ordinary garrison duties, and not called for guard until tattoo, when they will be posted for the night. Each man under instruction will have four tours of guard duty as non-commissioned officers. (Ins. 106, 1882.)

600. When there are no prisoners, men on guard will be required to attend telegraph practice, and recitations. When there are prisoners nothing will be allowed to interfere with guard duty; in such cases a special report will be made in connection with the report of men under instruction during the week. (Letter, Feb. 15, 1884.)

601. Enlisted men in confinement, charged with purely military offenses, not involving criminal elements, must keep up their studies and appear at recitations. (Letter, March 31, 1884.)

#### HOURS.

602. The hours for field practice will be prescribed by the officer in charge, in accordance with orders received from the Chief Signal Officer, and will include such time as may be necessary. (Ins. 106, 1882.)

603. During the prescribed hours men under instruction will either study in their rooms, present themselves in the recitation rooms, or work at field exercises, as may be prescribed. The officer of the day will inspect, morning, afternoon, and evening, to see that these directions are strictly followed. The weekly course of study will continue from Monday morning until 12 m. Saturday, all recitations on Saturday being held before 12 m. A schedule showing the hourly occupation of each man during study and field exercise hours will be kept by the senior instructor, as part of the permanent records of the school. (Ins. 106, 1882.)

#### REPORTS.

604. The following reports will be rendered by the officer in charge:

1. Annual report.
2. Monthly statement of enlistments, discharges, &c.
3. Monthly report of fire inspections. (See par. 654.)
4. Weekly reports of drills and instruction.
5. Morning report of the Signal Corps. (L. R. 1845, Sig., 1884.)

605. The weekly reports of instruction will receive the supervision and remarks of the officer in charge. (Letter, Jan. 15, 1881.)

606. The officer in charge will report the names of the enlisted men under instruction, in each class, who give evidence of special qualifications for any particular duty. (Letters, May 20 and 25, 1882.)

607. The weekly reports of the school for officers will state the number of weeks necessary to complete the unfinished part of the course of instruction. (Ins. 36, 1884.)

#### COURSE OF INSTRUCTION FOR ENLISTED MEN.

608. The following comprises the course of instruction for enlisted men:  
Drills and recitations in tactics. (See par. 596.)

#### THEORETICAL COURSE.

*First. Recitations in Cavalry Tactics*, as prescribed by par. 596.

*Second. Manual of Signals—Myer.*

- 1st lesson, to "alphabetic elementary code," page 36.  
2d " to "general applications," page 56.

- 3d lesson, to "day signals," page 76.  
 4th " to "field signals by three elements," page 96.  
 5th " from page 144, "homographic code" to "chronosemic signals," page 164.  
 6th " from page 164 to "open communication, &c.," page 180.  
 7th " from "description of equipments," page 189, to "candle bombs," page 207.  
 8th " from page 216, "composition fires" to "care of signal equipments," page 222, and from "telescopes and their uses," page 231, to "heliograph," page 240.  
 9th " from "heliograph," page 240, to "manual of the kit," page 261.  
 10th " from "manual of the kit," page 261, to middle of page 276.  
 11th " from "selecting stations," &c., page 273, to "complicating signals," page 305.  
 12th " from "signalling in cipher," page 319, to page 331, and from page 344, "route cipher," to "modes," &c., page 356.  
 13th " from "field telegraph train," page 361, to "recover the line," page 390.  
 14th " from page 390 to "general directions," page 396.  
 15th " review 1st, 2d, and 3d lessons.  
 16th " review 4th, 5th, and 6th lessons.  
 17th " review 7th, 8th, and 9th lessons.  
 18th " review 10th, 11th, and 12th lessons.  
 19th " review 13th and 14th lessons.

*Third. International Code of Signals.*

- 1st lesson, to "boat signals," part III.  
 2d " from "boat signals," to par. 12, page 12, part III, and all of "danger, distress, and storm-signal code."

*Fourth. Modern practice of the electric telegraph—Pope.*

- 1st lesson, chap. IV to par. 70, page 42.  
 2d " from par. 70 to par. 77, page 47, and from par. 87, page 57, to par. 103, page 64.  
 3d " chap. VI to par. 122, page 78, and chaps. VII and VIII.  
 4th " review chap. IV to par. 77, page 47.  
 5th " review from par. 87, page 57, to par. 103, page 64, and chap. VI to par. 122, page 78, and chaps. VII and VIII.

*Fifth. Manual of Signals.—Myer.*

- 1st lesson, from "permanent lines," page 402, to bottom of page 425.  
 2d " from top of page 426 to middle of page 448.  
 3d " from page 448 to "telephones," page 469.  
 4th " "telephones."  
 5th " review 1st and 2d lessons.  
 6th " review 3d and 4th lessons.

*Sixth. Meteorology.—Loomis.*

- 1st lesson, chapter I.  
 2d " chap. II to par. 52, page 34.  
 3d " from page 34 to bottom of page 53.  
 4th " chap. III.  
 5th " chap. IV to par. 140, page 79, omitting pars. 125 and 126.  
 6th " from page 79 to sec. II, page 93.  
 7th " from sec. II to bottom of page 107.  
 8th " sec. V to page 122.  
 9th " sec. VI to chap. VI, page 136.  
 10th " chap. VI to sec. II, page 147.  
 11th " sec. II to chap. VII, page 160.  
 12th " chap. VII to sec. III, page 173.  
 13th " "auroras" to par. 363, page 193, omitting pars. 357 to 369, inclusive.  
 14th " review to par. 70, page 44.  
 15th " review from page 44 to par. 140, page 79.  
 16th " review 6th and 7th lessons.  
 17th " review 8th and 9th lessons.  
 18th " review 10th and 11th lessons.  
 19th " review 12th and 13th lessons.

*Seventh. Instructions to Observers.*

- 1st lesson, par. 1 to par. 42, inclusive.
- 2d " par. 43 to par. 61, inclusive.
- 3d " par. 62 to par. 107, inclusive.
- 4th " par. 108 to Form 50, page 59, inclusive.
- 5th " meteorological forms to Form 114, page 70, inclusive.
- 6th " Form 115 to Form 203, page 80, inclusive.
- 7th " Form 204 to par. 144, inclusive.
- 8th " par. 145 to par. 178, inclusive.
- 9th " par. 179 to par. 258, inclusive.
- 10th " par. 259 to par. 306, inclusive.
- 11th " review 1st and 2d lessons.
- 12th " review 3d and 4th lessons.
- 13th " review 5th and 6th lessons.
- 14th " review 7th and 8th lessons.
- 15th " review 9th and 10th lessons.

Special Instructions, Instructions to special River Observers, and rules for the government of military telegraph lines, to be carefully read.

## PRACTICAL COURSE.

(See par. 596.)

609. *Wand practice*, one hour daily (see par. 612), from time of reporting at Fort Myer, until a rate of eight words per minute (receiving) is attained, and until ready for field signaling.

610. *Telegraph practice—Morse code*—Daily (see par. 612), two hours, until a rate of fifteen words per minute (receiving), and one hour, until a rate of twenty-five words is attained. Men attaining the latter rate will be excused from regular practice.

611. *Military signaling*.—Twelve days and four nights, general service code, short and 4-mile ranges; three days, international code; two days, homographic code; and one day, route cipher; three days, heliograph practice, general service code; three days, heliograph practice, Morse code. Ranges to be selected by the instructor.

612. *Practical duties of meteorological observers*.—A detail of two men will be made each day for instruction in the practical duties of observers, under the immediate supervision of the sergeant in charge of the observatory; *men serving on this detail will be excused from all other duties except recitations*. This will be the first on the list of details for the ensuing day. The men will be instructed in the use and method of cleaning and keeping in order all instruments used at stations of the Signal Service, and in making out all the different meteorological and property forms required from observers. Also in the manner of conducting official correspondence, briefing letters, treating inclosures, &c.

613. *Penmanship*.—Instruction in practical penmanship will be given until a fair and legible hand is attained. Copy-books and copies will be furnished by the instructor.

614. All enlisted men, except the permanent party, will be instructed in the use and connections of repeaters, telephones, and call-bells; setting up and cleaning of batteries; use, construction, and connections of Morse and other instruments used in the Signal Service telegraph offices; climbing, and the building and repairing of land-lines; the application of lightning conductors to lines and offices; methods of splicing and connecting submarine cables and land-lines; establishing terminal and intermediate stations; and finding the position of, and repairing faults in, telegraph lines and instruments. (Ins. 106, 1882.)

615. After the completion of the theoretical course the instructor will lecture on the following subjects:

## I.—METEOROLOGY.

Importance of the science in its relation to—

1. Health.
2. Farming communities.
3. Commerce.

## II.—THERMOMETERS.

1. General ideas of heat and expansion, linear and cubic.
2. The air thermometer.
3. Absolute zero, Fahrenheit's zero, Centigrade zero.
4. Calibration—Bessel's, Pettingen's, Neumann and Thiessen's, and Russel's methods.
5. Determination of the freezing-point.

6. Determination of the boiling-point.
7. Sudden and slow changes of the fiducial points of mercurial thermometers.
8. Comparison of thermometers.
9. Signal Service correction-cards.
10. Radiation.
11. Conduction.
12. Thermal properties of lamp-black, polished silver, mercury, glass, rock-salt, water, aqueous vapor, dry air.
13. Bright-bulb thermometers.
14. Black-bulb thermometers.
15. Bright and black bulbs in vacuo.
16. Solar radiation; relative observations.
17. Effects of heat as manifested:
  - a. In expansion and contraction.
  - b. In changes of season.
  - c. In permanent difference of temperature between equatorial and polar regions.
  - d. In evaporation and condensation.
  - e. Upon the land.
  - f. Upon the sea.
  - g. Upon the irregularities of the continent.
18. Temperature of the air:
  - a. Its fluctuations.
  - b. Its daily mean.
  - c. Its monthly mean.
  - d. Its annual mean.
  - e. Its distribution.
  - f. Its variation with the depth below the earth's surface.
  - g. Its variation with the height above the earth's surface.
19. Diurnal variation of the temperature of the air during the night-time.
20. Diurnal variation of the temperature of the air during the day-time.
21. Vertical distribution of temperature in the free air:
  - a. General ideas on the mechanical theory of heat.
  - b. Law of diminution of temperature in ascending dry air.
  - c. Law of diminution of temperature in ascending moist air when no condensation takes place.
  - d. Diminution of temperature when condensation takes place, namely, inside of cloud masses.
  - e. Law of warming in descending masses of air; explanation of the Föhn.
22. Geographical distribution of atmospheric temperature:
  - a. Meech, theoretical distribution of solar radiation.
  - b. Actual distribution of temperature by isotherms.
  - c. General average temperature of the whole globe.
    - (a.) Northern hemisphere.
    - (b.) Southern hemisphere.

### III.—BAROMETERS.

1. Pressure of the air:
  - a. Fluctuations, periodical and irregular.
  - b. Diurnal range.
  - c. Diminution with elevation above earth.
  - d. Distribution.
  - e. Tides.
2. Areas of high and low pressure.
3. Siphon barometer.
4. Corrections for instrumental errors and peculiarities:
  - a. Graduation errors of the scale and elastic stretch or set.
  - b. Temperature of the scale.
  - c. Temperature of the mercury.
  - d. Impurity and density of the mercury.
  - e. Capillarity in the tube and in the cistern.
  - f. Imperfect vacuum (Arago's method) and tension of mercury vapor.
  - g. Verticality.
  - h. Variation of gravity with latitude (Wild's correction table).
  - i. Variation of gravity with altitude.
5. Aneroid barometers:
  - a. Vidi, 1850.
  - b. Naudet.
  - c. Goldschmid.

6. Construction and handling.
7. Setting.
8. Corrections for.
9. Comparisons of barometers:
  - a. Reading forward and backward.
  - b. Constant personal errors.
10. Signal Service barometer correction-cards.

## IV.—WIND STORMS.

1. Cause of the motion of the air.
2. Constant and periodical winds.
3. Wind direction.
4. Tornadoes and hurricanes.

## V.—ANEMOMETERS.

1. Arbitrary wind scales:
  - a. Mannheim, 0-4.
  - b. French, 0-7.
  - c. Beaufort, 0-12.
  - d. Signal Service, 0-8.
  - e. International, 0-10.
2. Wind pressure. Rouse's formula: pressure (pounds per square foot) =  $0.006 \times$  velocity<sup>2</sup> (miles per hour).
3. Velocity anemometers:
  - a. Robinson.
  - b. Hagemann.
4. Pressure anemometers:
  - a. Wild.
  - b. Lind.
  - c. Osler.
5. Relations between pressure and velocity and shade of body:
  - a. Hagen, and plane surfaces.
  - b. Robinson, Dohrandt and Thiesen, and hollow hemispherical cups.
6. Thiesen's formula for Robinson's anemometer.
7. Dohrandt's formula for Wild's tablet anemometer.
8. Abbe's combined barometer and anemometer.

## VI.—AQUEOUS VAPOR AND HYGROMETERS.

1. Clouds, fog, dry fog, mist, kind of clouds. Upper and lower clouds. Velocity, direction, and height of clouds. Various appearances due to clouds—halos, coronæ, sun's drawing water, &c.
2. Rain, snow, and hail:
  - a. Cause of precipitation of the moisture of the air.
  - b. Its distribution over the earth's surface.
  - c. Influence on precipitation of the ocean, mountain ranges, winds, and the seasons.
3. The general functions and importance of aqueous vapor.
4. Dew-point, vapor tension, weight of vapor, relative humidity, evaporation.
5. Various methods employed and corresponding apparatus.
6. Regnault's theory of the action of the wet-bulb thermometer, based on the consideration of the convection of the heat by a gentle current of air.
7. The deduction of Regnault's formula from the following fundamental hypotheses:
  - a. That the thin layer of air that supplies heat to the wet-bulb thereby falls to the temperature  $t'$ .
  - b. That the heat used up in evaporation comes only from this thin layer.
  - c. That this layer is completely saturated at the temperature  $t'$ .
8. Maxwell's theory of the action of the wet-bulb thermometer, based on the consideration of the radiation, conduction, and diffusion of heat and moisture.
9. The deduction of Maxwell's formula from the following fundamental hypotheses:
  - a. That the thin layer of air is quiescent and supplies heat to the wet-bulb only by conduction and radiation.
  - b. That the moisture evaporates only by a process of diffusion.

## VII.—LOCATION OF STATIONS AND INSTRUMENTS.

1. Importance of an accurate determination of the elevation of meteorological instruments.



2. The points on the instruments from which measurements should be made.
3. Elevation of the barometer cistern :
  - a. The universal fixed "base," mean low tide, mean high tide, or mean tide.
  - b. The "plane of reference," such as railroad track at depot, level of one of the great lakes, or some well-known and permanent point accepted by civil engineers.
  - c. A "fixed point," near the base of the building in which the office is located.
4. Elevations above ground of the thermometers, rain-gauge, anemometer, anemoscope or wind-vane.
5. Leveling by :
  - a. Tape-line.
  - b. Spirit-level.
  - c. Barometer.
  - d. Boiling-point of water.
  - e. Trigonometrical methods.
6. Latitude.
7. Longitude.
8. Time.

#### VIII.—ACTINOMETERS.

1. Pouillet.
2. Herschel.
3. Violle.
4. Crova.
5. Langley.

#### IX.—MAGNETIC APPARATUS.

1. General idea of terrestrial magnetism as presented by Gauss.
2. Formulæ for the action of the earth or other body upon magnetic needle.
3. General description of the declinometer or unifilar magnetometer; methods of making and reducing observations of declination and horizontal force.
4. General description of the vertical circle, methods of making and reducing observations of the inclination of the needle.

#### X.—ELECTRICITY.

1. Atmospheric.
2. Ground currents.

#### XI.—SUN SPOTS.

1. The nature of sun spots; theories of Herschel, Secchi, Young, and others.
2. Connection between sun spots and disturbances of the earth's magnetism.
3. Periodicity and apparent connection with the meteorology of the earth.

#### XII.—AURORAS.

1. Description of the different appearances.
2. Connection with electricity and magnetism.
3. Height of the aurora.
4. Different explanations of the phenomenon offered by scientists.

#### XIII.—PERIODICITY IN METEOROLOGICAL PHENOMENA.

#### XIV.—GRAPHIC METHODS OF REPRESENTING METEOROLOGICAL DATA.

616. Notes of each lecture will be made by the men under instruction, and the class will recite on the subjects treated of. The men will be marked on the notes and recitations of each lecture, and these marks will form an important consideration in determining the relative standing of the men at the time of graduation.

617. The lectures will be so prepared as to give the men under instruction useful and practical information as Signal Service observers.

618. The examination of the class under instruction will take place so as to be completed by the end of the sixth month of the course. (Ins. 106, 1882.)

#### COURSE OF INSTRUCTION FOR OFFICERS.

619. The following comprises the course of instruction for officers :

##### THEORETICAL COURSE.

##### First. Cavalry Tactics.

1st lesson, from "sabre exercise," page 31, to "inspection of arms," page 65.

2d " from "inspection of arms," page 65, to "to face the line," &c., page 93.

- 3d lesson, from "to face the line," &c., page 93, to "school of the battalion dismounted," page 114.  
 4th " from page 114, "school of the battalion dismounted," to "school of the soldier mounted," page 133.  
 5th " from "school of the soldier mounted," page 133, to "manual of the sabre, mounted," page 165.  
 6th " from "manual of the sabre, mounted," page 165, to par. 523, page 193.  
 7th " from par. 523, page 193, to "charge," page 233.  
 8th " from "charge," page 233, to "school of the battalion," page 270.  
 9th " from "ceremonies," page 410, to "funeral honors," page 451.  
 10th " from "funeral honors," page 451, to bottom of page 484.  
 11th " review 1st, 2d, and 3d lessons.  
 12th " review 4th, 5th, and 6th lessons.  
 13th " review 7th, 8th, 9th, and 10th lessons.

*Customs of Service.—Kauts.*

- 1st lesson, to "military justice," page 78.  
 2d " from page 78 to "retiring board," page 126.  
 3d " from page 126 to "regimental staff," page 169.  
 4th " from page 169 to "captain," page 223.  
 5th " from page 223 to "officer of the day," page 260.  
 6th " from page 260 to "commanding officer," page 317.  
 7th " from page 317 to end of book, page 380.

*Second. Manual of Signals.—Myer.*

- 1st lesson, to top of page 65.  
 2d " from top of page 65 to top of page 95.  
 3d " from top of page 95 to top of page 180.  
 4th " from top of page 180 to page 222, "care of signal apparatus."  
 5th " from page 222 to bottom of page 241.  
 6th " from top of page 242 to page 276, "selecting," &c.  
 7th " from page 276 to page 305, "complicating signals."  
 8th " from page 305 to page 344, "route ciphers."  
 9th " from page 344 to page 381, "field telegraph train."  
 10th " from page 381 to page 402, "permanent lines."  
 11th " review to top of page 95.  
 12th " review from page 95 to page 222, "care of signal apparatus."  
 13th " review from page 222 to page 276, "selecting," &c.  
 14th " review from page 276 to page 344, "route ciphers."  
 15th " review from page 344 to page 402, "permanent lines."  
 16th " general service of Signal Corps, page 490 to end of book; balance of book to be taken after Prescott (sixth).

*Third. Cipher Manual.*

- 1st lesson, to middle of page 53.  
 2d " to end of book.

*Fourth. International Code of Signals, and Danger, Distress, and Storm-Signal Code.*

- 1st lesson, to "boat signals," part III.  
 2d " part III, "boat and coast signals," to par. 12, page 12, and "Signal Service Official Distress and Danger Signals."

*Fifth. Military Surveying.—Mendell.*

- 1st lesson, to bottom of page 27.  
 2d " to bottom of page 44.  
 3d " to "sextant," page 60.  
 4th " to bottom of page 77.  
 5th " to "Mason's level," page 96.  
 6th " to "locate or plot," page 116.  
 7th " to end of chap. VI, page 131.  
 8th " chaps. VII and VIII, to page 152.  
 9th " chap. IX to middle of page 171.  
 10th " to end of book.  
 11th " review 1st and 2d lessons.  
 12th " review 3d and 4th lessons.  
 13th " review 5th and 6th lessons.

- 14th lesson, review 7th and 8th lessons.  
 15th " review 9th and 10th lessons.

*Sixth. Electricity and the Electric Telegraph.—Prescott.*

- 1st lesson, chaps. I, II, and III to bottom of page 24.  
 2d " chaps. IV, V, and VI to bottom of page 46.  
 3d " chap. VII to bottom of page 63.  
 4th " chaps. VIII and IX to bottom of page 85.  
 5th " chaps. X and XI to bottom of page 102.  
 6th " chaps. XII and XIII to bottom of page 129.  
 7th " chaps. XIV and XV to "reflecting or mirror galvanometers," page 148.  
 8th " from page 148 to bottom of page 166.  
 9th " chap. XVI to bottom of page 184.  
 10th " chap. XVII to bottom of page 201.  
 11th " chap. XVIII to bottom of page 224.  
 12th " from bottom of page 224 to "measurements by Wheatstone Bridge," page 241.  
 13th " from page 241 to bottom of page 261.  
 14th " chap. XXI to bottom of page 280.  
 15th " chaps. XXII and XXIII to "construction of land lines in England," page 307.  
 16th " from page 307 to bottom of page 336.  
 17th " chap. XXV to bottom of page 354.  
 18th " chap. XXVI to "specific resistance of insulators," page 373.  
 19th " from page 373 to "duration of variable state," page 393.  
 20th " from page 393 to bottom of page 413.  
 21st " chaps. XXIX and XXX to "arrangement for terminal stations," page 455.  
 22d " from page 455 to bottom of page 477.  
 23d " chap. XXXI to "the direct working polarized ink-writer," page 513.  
 24th " remainder of chaps. XXXI and XXXII (omitting chap. XXXII as far as "apparatus for working submarine cable," page 552) to bottom of page 561.  
 25th " chap. XXXIII to "Stearns' differential duplex," page 795.  
 26th " from page 795 to bottom of page 824.  
 27th " chaps. XXXIX and XL to "W. U. standard quadruplex," page 851.  
 28th " from page 851 to bottom of page 882.  
 29th " chaps. XLII and XLIII to "differential galvanometers," page 909.  
 30th " from page 909 to page 923.  
 31st " chap. XLIV to "remarks on bridge," page 937.  
 32d " from page 937 to end of book, page 963.  
 Review, 16 lessons, each equal to two advance lessons.  
 Total lessons, 48.

*Seventh. Manual of Signals.*

- 1st lesson, from "permanent lines," page 402, to "telephones," page 469.  
 2d " "telephones," page 469 to page 490.

PRACTICAL COURSE.

620. *Wand practice—General Service code.*—Daily, not less than two hours, and to be continued until the rate of ten words per minute, receiving, is attained. Practice to begin after 1st lesson in Manual of Signals.

621. *Telegraph practice—Morse code.*—Daily, not less than two hours, until able to receive at the rate of fifteen words per minute. When from any cause there is no field work, drawing, or recitation, these hours to be doubled.

622. Practical instruction to be given in setting up the Marean repeater, telephones, Morse instruments and batteries, splicing and connecting cables and land lines, and use of galvanometer and resistance coils.

623. *Military signaling.*

1st day, G. S. code, 4-foot flags, Fort Myer and Naval Observatory.

2d day, G. S. code, 4-foot flags, Fort Myer and Washington Monument.

3d day, G. S. code 2-foot flags, Fort Myer and Washington Monument. Torch practice at night.

4th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home.

5th day, G. S. code, 2-foot flags, Fort Myer and Soldiers' Home. Torch practice at night.

6th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home. Cipher disk, 1st case.

- 7th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home. Cipher disk, 2d case. Torch, cipher disk, 1st and 2d cases.
- 8th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home. Cipher disk, 3d case.
- 9th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home. Cipher disk, 4th case. Torch, cipher disk, 3d and 4th cases.
- 10th day, G. S. code, 2-foot flags, Fort Myer and Soldiers' Home. Countersign word.
- 11th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home. Route cipher. Torch, route cipher.
- 12th day, G. S. code, 4-foot flags, Fort Myer and Soldiers' Home. Opening station and communication without a preconcerted code.
- 13th day, 4-foot flags, Fort Myer and Soldiers' Home. Opening communication without preconcerted code.
- 14th day, G. S. homographic code. Fort Myer and Naval Observatory.
- 15th day, hunting station from Fort Myer.
- 16th day, G. S. code. Repeating stations, short ranges.
- 17th day, International code, flag.
- 18th day, G. S. code, 4-foot flags, Soldiers' Home and Munson's. Torch practice.
- 19th day, International code, flag.
- 20th day, International code, distant signals.
- 21st day, G. S. code, 15-mile range, 4-foot flags. Torch at night.
- 22d day, heliograph, G. S. code, Fort Myer and Soldiers' Home.
- 23d day, heliograph, G. S. code, Fort Myer and Soldiers' Home.
- 24th day, heliograph, G. S. code, Fort Myer and Soldiers' Home.
- 25th day, heliograph, Morse code, Fort Myer and Soldiers' Home.
- 26th day, heliograph, G. S. code, Fort Myer and Munson's.
- 27th day, heliograph, G. S. code, Fort Myer and Munson's.
- 28th day, heliograph, Morse code, Fort Myer and Munson's.
- 29th day, heliograph, Morse code, Fort Myer and Munson's.
- 30th day, "puffs and flashes" (chronosemic), bombs and rockets at night.
- 31st day, heliograph, Fort Myer and Sugar Loaf Mountain.
- 32d day, same.

624. A day's practice will consist of at least five hours', and a night's practice of at least three hours', work, and, to be satisfactory, the following number of messages must be sent and an equal number received, each message to contain not less than ten words, excluding address and signature, viz:

Short ranges: flag, 20 messages; torch, 8 messages.

Intermediate (9-mile) range: flag, 15 messages; torch, 6 messages.

Long ranges (15 miles): flag, 10 messages; torch, 4 messages.

Long ranges (water): flag, 10 messages; torch, 4 messages.

International signals: 60 hoists made; 60 hoists read.

Heliograph: 30 messages.

When using cipher, and in repeating stations and working over the longest range with heliograph, one-half the above numbers will be required.

625. *Military surveying*.—Fifteen days' field work, with sextant, plane table, compass and level; work to begin as soon after September 1st as practicable.

626. *Mapping*.—Field-notes to be entered on map on days when out-door work is not practicable.

627. *Field sketching*.—Ten lessons, to be distributed through the course, each lesson embracing a complete field sketch of the country indicated by the instructor, to be taken on the field. The character and kind of work required is comprehensively indicated on pages 167 to 184, Mendell's *Military Surveying*, which will be the text-book used, and from which the instructor will carefully elaborate the work he requires. Finished drawings are not desired, but field sketches produced with such material as can be easily carried. The officer in charge will give especial attention to the carrying out of this instruction, and the sketches will be exhibited at the conclusion of the course. In making these sketches the "Topographical Field Note-book" of the Engineer Corps of the Army will be used.

628. The lectures, and the recitations upon the subjects treated of in them, will be so arranged as not to interfere with the current recitations, which will not be omitted. (Ins. 133, 1881.)

#### BUILDINGS, QUARTERS, AND GROUNDS.

629. All buildings of whatever nature or kind constructed at Fort Myer, Virginia, will be placed either on the extension of the main line of officers' quarters or upon parallels or perpendiculars to that line. No wooden part of any building will be placed nearer than eight (8) inches to the earth at any point. (Ins. 49, 1882.)

630. The necessary quarters shall be set apart for the permanent use of the officer in charge and instructors. (Letter, April 15, 1881.)

631. Walking on any part of the prepared grounds is prohibited; the walks and roads only will be used. In summer the lawns and parades will be mown once each week. (Letter, Dec. 1, 1883.)

632. The use of the ground at the Soldiers' Home, in this city, has been obtained for the purpose of instructing the class at Fort Myer in military signaling; enlisted men will be cautioned against pulling flowers, damaging property, or littering the grounds. (Letter, Sept. 28, 1883.)

#### ROOM REGULATIONS.

633. At "school call" all men under instruction will at once repair to their rooms or other places especially designated, and the hours prescribed for study will be exclusively devoted to this purpose. (See par. 612—Ins. 72, 1882.)

634. Within 20 minutes after reveille, rooms will be put in complete order. (Ins. 72, 1882.)

635. Each man will, immediately after reveille, put such articles in the clothes-bag as it is intended to contain, arrange his bedding and all his other effects in the prescribed order. He will also attend to the good order and arrangement of his own arms, accoutrements, clothing, and other effects. (Ins. 72, 1882.)

#### DUTIES OF ROOM ORDERLY.

636. An orderly will be detailed for each room occupied by men under instruction, and will perform the duties for one week, unless otherwise directed. (Ins. 72, 1882.)

637. The orderly will see that the names of all the occupants of the room are on the orderly board, his own name being first. He will be responsible for the cleanliness of the wash-stand, shelves, and other fixtures, for the general police of the room, and for the strict observance of regulations and orders therein. He will be strictly responsible for the preservation of all public property attached to the room. Every morning, immediately after reveille roll-call, he will thoroughly sweep every part of the room, brush the dust from the furniture, sweep the dirt into a pile, and deposit it in the place provided for that purpose, to be removed by the janitor before guard-mounting. He will see that a light is in his room immediately after evening school-call. After tattoo, and at or before taps, he will cause all lights in the room, not authorized, to be extinguished. He will answer promptly and fully every official question put to him by proper authority concerning his duty as orderly. Whenever an orderly is absent from his room, or is prevented by sickness from attending to his duty, the occupant longest off duty, who is present for duty, will perform the duties of orderly, and be accountable for their faithful discharge, in the same manner as if regularly detailed. (Ins. 72, 1882.)

638. Room orderlies will change after Sunday morning inspection. (Ins. 7, 1882.)

639. During call to quarters, between twenty minutes after reveille and tattoo, the following arrangement of furniture, &c., will be required:

Forge-caps, belts, sabers, spurs, hung on pegs; white helmets on clothes-press, over muzzle of carbine.

Carbines in gun-rack.

Arms will not be taken to pieces unless by permission of a commissioned officer, nor under any circumstances will attempts be permitted to beautify or change the finish of the exterior by altering the metallic or wooden parts. The surface of the bore will be protected from rust by occasional use of an oiled rag.

Bedsteads: against side wall of room, the head against end wall of room.

Bedding: mattress to be folded once. Blankets and sheets to be neatly and separately folded, so that the fold shall be of the width of the pillow, and piled at the head of the bedstead in the following order, viz: mattress, sheets, pillows, and blankets, the front edge of the sheets, pillows, &c., to be vertical.

The overcoat will be neatly folded and placed on top of the pile of bedding. On Sunday afternoon the beds may be made down and used.

Books: the books issued by the instruction department and other authorized books will be placed in book-rack.

Clothes-press: brushes (tooth and hair), combs, shaving implements and materials, such small boxes as may be allowed, vials, &c., to be arranged on upper shelf. Collars, gloves, handkerchiefs, socks, shirts, drawers, &c., to be neatly arranged on the other shelves, the heaviest articles on the lower shelves.

Arrangement: all articles of the same kind are to be carefully and neatly placed in one pile; the folded edges to be to the front and even with the front edge of the shelf. Nothing will be allowed between these piles of clothing and the back of the press, unless the want of room renders it necessary.

Soiled clothes to be kept in clothes-bag; shoes and overshoes to be kept cleaned, dusted, and arranged in a line at the side and near the foot of the bedstead.

Locker at foot of bedstead.

The dress-coat, helmet, blouse, and pants to be kept in locker.

Broom, dust-pan, brush, and duster to be kept in corner behind the door.

Tables in the middle of the room.

Chairs, when not in use, to be against the owners' tables.

Looking-glass, against the wall near wash-stand.

Wash-stand to be kept neat and clean.

Towels neatly folded and hung on racks.

Curtains: curtains of clothes-press to be kept drawn, except when policing room.

Front window curtain will be kept up during call to quarters, from reveille to tattoo.

Floor to be kept clean and free from grease spots and stains.

Walls and wood-work to be kept free from cobwebs, and not injured by nails or otherwise.

Names, uniformly printed, will be posted over pews, clothes-press, and on orderly boards. Baskets, pictures, clocks, statues, trunks, boxes, and uniform clothing are not allowed in quarters.

The use of shoe brushes and blacking in quarters is prohibited.

Musical instruments, or the implements used in chess, backgammon, or any other game, will not be introduced into barracks. (Ins. 72, 1882.)

640. Articles of food will not be taken into quarters, and no man shall bring, or cause to be brought, within the limits of the post, any spirituous or intoxicating liquor, or have the same in his room or otherwise in his possession. (Ins. 72, 1882.)

641. The arms or other public property shall not be taken from quarters except for duty, and no man shall lend or exchange his arms or accoutrements, or use those of any other man, without permission of the officer of the day. (Ins. 72, 1882.)

642. Men are prohibited from having in their possession any description of fire-arms or other weapons not issued to them by proper authority. (Ins. 72, 1882.)

643. No man shall post any placard or notice upon any of the public buildings, or affix to the walls of his room any map, picture, or piece of writing, without the permission of the officer in charge. (Ins. 72, 1882.)

644. No man shall introduce a citizen into barracks during study hours, upon any pretence whatever; nor at any time, except by permission of the officer in charge. (Ins. 72, 1882.)

645. Civilian clothing will be packed in trunks, which will be stored in a safe and suitable place, and no trunks or civilian clothing will be permitted in quarters, nor shall enlisted men be permitted to wear the same, or to keep the same in their possession, unless they are on furlough for not less than twenty-four hours. This applies equally to all enlisted men at Fort Myer. (Ins. 1, 1882.)

646. Hair: Every man will have his hair neatly cut (cropped) at least once in each month, and between the 1st and 10th days. A book showing the name of each man and the date of hair-cutting will be kept in the barber-shop. Men under instruction will always appear for duty, including lectures and recitations, with hair neatly brushed, shoes blacked, and dress in a neat condition. (Ins. 72, 1882.)

647. Tobacco: The use of tobacco is prohibited during study hours, and in quarters at all times. Men may smoke on piazza of barracks during release from quarters. (Ins. 72, 1882.)

648. Animals: No pet or other animal will be kept. (Ins. 72, 1882.)

649. Baths: All men will bathe at least once a week, and a book will be kept by the 1st Sergeant, in which will be entered names and dates showing when each man bathes. (Ins. 72, 1882.)

#### UNIFORM.

650. The following articles of uniform are prescribed for men under instruction:

Cuffs: Of white linen; ordinary pattern.

Collar: Of white linen; a plain standing collar one and one-half inches wide, according to pattern deposited in the Office of the Chief Signal Officer.

Cravat: A plain black stockband with buckle, according to pattern deposited in the Office of the Chief Signal Officer.

This is intended to give men in the school a neat appearance, and not in the sense of any change of the prescribed uniform. (Ins. 72, 1882.)

651. The adoption of white helmets renders straw hats, formerly authorized on the frontier, now unnecessary, and their use is prohibited. (Letter, July 26, 1883.)

#### INSPECTION.

652. At Sunday morning inspections at Fort Myer the Regulations of the Army, Article LXX, paragraphs 1320-1345, will be strictly followed, including the exercising of the troops and the march in review, in two ranks, at which all enlisted men, except the guard and sick, will be present. After this, all stables, animals, quarters, guard-house, bakery, and hospital will be carefully inspected by the officer in charge, and steps taken to correct all defects and irregularities. (Ins. 74, 1882.)

653. Each Saturday afternoon teamsters will be required to clean their wagons, take apart and clean their harness, and then put their teams in complete order for inspection on Sunday. (Ins. 74, 1882.)

654. With a view to insure the utmost possible security against fire, the officer in charge, the post quartermaster, and the medical officer, will, on the 15th day of each month, carefully inspect all the buildings of the post, giving special attention to the fires, flues, and other places where it is possible for fire to originate or communicate. The officer in charge will make a full report, in writing, of each inspection. (Letter, June 28, 1883.)

#### POLICE.

655. The police of quarters of the enlisted men will be inspected by the officer of the day, each day, between 20 minutes after reveille and 8 a. m., and once afterwards during study hours, when the utmost exactness of arrangement and cleanliness of rooms, furniture, bedding, clothing, &c., will be required, and violations in this respect reported and corrected. (Ins. 106, 1882.)

656. Every Saturday, immediately after 1 p. m., there will be general police of the entire post under the eye of the officer of the day, at which duty all men present at the post will attend, except the guard and sick; the work will be continued until the entire post is thoroughly policed. (Ins. 106, 1882.)

657. Two men of the permanent party will be detailed to report to the police sergeant for continuous police duty. These two men will actually sweep, each day, the roads, gutters, and walks of the whole post, excepting one day each week, when they will go over the road from the cemetery to the aqueduct bridge. (Letter, Nov. 6, 1883.)

#### ADMINISTRATION AND SUPPLY.

658. For purposes of administration and supply the enlisted men of the Signal Corps, U. S. Army, will be divided equally into a battalion of four companies. (S. S. O. 31, 1881.)

659. The officer in charge at Fort Myer, Virginia, will be, *ex officio*, the battalion commander. (S. S. O. 31, 1881.)

660. The post quartermaster at Fort Myer, Virginia, is designated the battalion quartermaster. (S. S. O. 31, 1881.)

661. All requisitions for clothing and equipments will be sent to the battalion quartermaster on Form 49. To save expense, these requisitions will be sent in semi-annually, in time to reach Fort Myer before the 15th day of March and the 15th day of September of each year, so that the articles may be shipped with the regular supplies to stations. Requisitions at irregular periods must be accompanied by explanations of necessity to justify the irregularity. (S. S. O. 31, 1881.)

662. The men on duty at the office of the Chief Signal Officer will make their requisitions for clothing on the first days of January, April, July, and October. (S. S. O. 31, 1881.)

663. All accounts of the enlisted men of the Signal Corps will be kept under the direction of the officer in charge at Fort Myer. (S. S. O. 31, 1881.)

664. All discharges, final statements, and other papers relating to soldiers' accounts, except enlistments and the warrants of non-commissioned officers, will be prepared at Fort Myer. (S. S. O. 31, 1881.)

665. Whenever application for discharge is made upon grounds of physical disability, the forms prescribed by General Regulations, 1863, will be used so far as they are practicable. (S. S. O. 31, 1881.)

#### RECRUITING AND DISCHARGE.

666. All recruiting for the Signal Corps will be done at the Office of the Chief Signal Officer, and the following rules will be observed in discharging men:

1. The officer in charge at Fort Myer, Virginia, will sign all final statements of men discharged at this office, and will also prepare all discharge papers, in such cases, for the signature of the Chief Signal Officer, the character to be left blank, excepting in the cases of men serving at Fort Myer. In cases of expiration of term of service these papers will be sent to the Office of the Chief Signal Officer without notification, and in time to be received here on the day of the expiration of enlistment. No descriptive list will be forwarded to this office in such cases, but a copy of all final statements will be furnished for file here.

2. Discharge papers and final statements for men on station will be made up, on notification from this office, to prospective date of discharge, and will not be signed. They will be accompanied by descriptive lists signed by the officer in charge at Fort Myer, Virginia. (Letter, February 5, 1883.)

## MUSTER AND PAY ROLLS.

667. The enlisted force of the Signal Corps will be divided into three detachments, for the purpose of payment only, and each detachment will be paid upon its own rolls, as follows:

1. The enlisted men on duty at Fort Myer, Virginia, will constitute Detachment One; those on duty at this office, Detachment Two; and those whose stations are elsewhere than at this office or Fort Myer, Detachment Three. Detachment One will be paid bi-monthly, and Detachments Two and Three, monthly. The pay-roll of Detachment One will be prepared and signed, in triplicate, by the officer in charge at Fort Myer, Virginia, two copies to be forwarded to the paymaster and one copy to be retained at Fort Myer.

2. Bi-monthly muster rolls of the companies of the corps, as now constituted, will be prepared and signed, in duplicate, by the officer in charge at Fort Myer, Virginia, with payment last made previous to the date of said muster, and by whom, noted thereon, with all other data as to station, &c., as required by the notes on the muster-rolls. One copy of these muster-rolls will be forwarded to the Adjutant-General of the Army, through this office, within fifteen (15) days after muster.

Recruits will be so assigned as to keep the companies of equal size as nearly as possible. (Letter, February 5, 1883.)

## POST GARDEN AND GREENHOUSE.

668. The post garden is provided for the benefit of the enlisted men, whose needs will be supplied from it. Should there be more than is necessary for this purpose, officers and their families may be supplied. (Letter, March 22, 1882.)

669. The benefits of the greenhouse will be enjoyed by all at the post. Such flowers and plants as would otherwise go to waste may be used for private purposes and persons may own plants and pots that may be kept in the greenhouse, which will receive such care as shall not interfere with the necessary space of the house and the necessary time of the keeper. Flowers that are usually cut will be so distributed that all belonging to the corps (so far as may be) will be equally benefited, and especially will this be observed with the sick and the enlisted men on holidays and social occasions; but in the management of the greenhouse, its chief purpose will always govern, that is, to propagate plants to suitably and tastefully ornament the grounds of the post, as is usual in such public grounds. (Letter, March 22, 1882.)

## MAIL.

670. The mail will be sent to the post-office and the central office in sealed pouches by ambulance or market-wagon at their regular trips. (Letters, June 2 and 15, 1882.)

## DOMESTIC ANIMALS.

671. Domestic animals that are useful, and such as are usually kept at military posts, may be owned and kept at Fort Myer, but they will be subsisted entirely from private means. (Letter, March 22, 1882.)

672. Enlisted men who own cows may have the use of pasturage free, but not of cut hay, all of which must be used for animals entitled to public forage.

673. Officers permanently stationed at the post may each keep one cow on the public grounds. The hospital and married men will also be allowed to keep one cow each, and no more, and the milk will be sold to enlisted men, if needed, and the post council shall regulate the price. (Letter, July 20, 1882.)

674. No cattle, except milch cows as prescribed, will be kept at Fort Myer. (Letter July 20, 1882.)

675. The officer in charge shall establish rules which will effectually guard against cows getting into the garden or orchards. (Letter, Feb. 5, 1884.)

## PUBLIC ANIMALS.

676. Public animals will not be ridden, except by special direction of the officer in charge, at any other pace than a walk or trot. All violations of this paragraph will be severely punished. (Letter, April 28, 1881.)

677. Public animals at Fort Myer shall be used as follows:

1. For messengers when especially necessary.
2. For officers when on mounted duty; also to ride when the horses require exercise, but not to be driven in harness.
3. One horse for market-wagon when there is no mule.
4. The three 4-mule teams shall be used for ordinary hauling, and shall be driven complete except when necessity requires that they be used as 2-mule teams.
5. Public animals will not be used for private purposes. (Letter May 29, 1883.)



678. Special care will be given to the neat and proper appearance of all teams and riding animals leaving the post, and the officer in charge will require such careful inspection of teams and messenger horses as will insure this. (Ins. 20, 1883.)

679. Officers entitled to horses may keep them in the public stables and pastures. No other horses will be kept by them at the post.

680. The officer of the day will attend "Stable Call," morning and evening. He will see that all public animals are properly groomed, and that each animal receives daily nine pounds of grain and fourteen pounds of hay, in three feeds if practicable, otherwise in two feeds. He will sign a certificate with the guard-report at the end of his tour of duty that this work has been done. (Ins. 48, 1884.)

681. The public mules (market wagon excepted) will not be driven on pavements faster than a walk. (Ins. 7, 1884; Letter March 15, 1884.)

682. The use of wagons forming any part of a signal telegraph train, for the transportation of commissary and quartermaster stores, or for any purpose, other than the necessary drills, the construction and repair of telegraph lines, and the transportation of telegraphic material, is prohibited. (G. O. 9, 1889.)

683. The calls will be so arranged that there will be a full half hour at "Stable Call" for the men to groom the public animals after they arrive at the stable. (Letter, Nov. 27, 1883.)

684. Men under instruction will be taught the principles and first practice of grooming, after which they will be exempt for the better prosecution of their duties. With this exception, grooming will be done by the permanent party. (Ins. 106, 1882.)

#### PERMANENT PARTY.

685. The permanent party under the direction of the officer in charge will be constituted as follows, and will perform the following prescribed duties, and such other duties as he may direct:

- 1 1st Sergeant.
- 1 Sergeant or Corporal, who shall assist the 1st Sergeant and do clerical duty.
- 1 Quartermaster Sergeant, in charge of corrals and public animals.
- 1 Police Sergeant, in charge of all policing of the post, of warning all laborers required from Freedman's Village and renters; and who shall prevent trespassing on public grounds, and grounds adjoining road to aqueduct bridge.
- 1 Quartermaster's clerk, who shall have immediate charge of Quartermaster's stores.
- 1 Clerk, who shall have charge of the rolls of Signal Service men.
- 1 Engineer.
- 1 Plumber and tinner, who shall have charge of the bath-house, heaters for dormitories, water closets, and lamps.
- 1 Farmer, who will be a corporal, and a good, practical, farmer and gardener.
- 1 Janitor.
- 1 Blacksmith (civilian).
- 1 Tailor.
- 1 Hospital steward.
- 1 School-teacher.
- 1 Baker.
- 1 Saddler, on ordnance extra duty.
- 1 Carpenter.
- 1 Painter.
- 2 Buglers.
- 3 Cooks, two for men's mess and one for hospital.
- 11 Teamsters and laborers.

The officer in charge will, without delay, arrange the permanent party according to the foregoing, recommending for discharge all those now in service not thoroughly competent to form the most efficient party practicable. (Ins. 165, 1882.)

686. The engineer, plumber, blacksmith, tailor, saddler, carpenter, painter, buglers, hospital cook, teamsters, and laborers, will be liable for detail, when not needed in their special work, for any labor the officer in charge may require; and especially in working in the garden or on the farm and grounds. (Ins. 165, 1882.)

687. No married men will in future be enlisted in the permanent party, nor will any of those now married be re-enlisted, or any single man be permitted to marry without the written authority of the Chief Signal Officer. (Ins. 165, 1882.)

688. Men temporarily employed at the post to put the grounds in order will not be put at work on farm or garden, but enlisted men of the permanent party will do the work of the garden and farm. When the need for labor is greatest, the plumber, saddler, engineer, tailor, and all other artisans, teamsters, and laborers, will be employed in the garden, or at other duties, as they may be needed. This will apply to the hospital cook, buglers, and baker, except when the quartermaster shall say that they

are required at their trades or public works, for at least one-half day at a time. (Ins. 20, 1883.)

689. All enlisted men will live at the post. (Ins. 20, 1883.)

#### TELEGRAPH LINES.

690. 2d Lieutenant James A. Swift, Signal Corps, U. S. Army, shall have charge and supervision of all telegraph lines running between the Signal Office and Fort Myer, and shall be furnished such assistance as he may desire for their repair. (Letter, July 6, 1881.)

691. Whenever a fault occurs in the telephone line between the Signal Office and Fort Myer it will be repaired by a detail from the post. (Letter, June 29, 1881.)

#### COURTS-MARTIAL AND BOARDS.

692. Courts-martial and boards of survey shall sit at hours that will not interfere with recitations. (Letter, July 20, 1881.)

693. In all examination of enlisted men at or from Fort Myer, Virginia, the board will sit in uniform and the men will appear in uniform. (Ins. 76, 1884.)

## APPENDIX 2.

### REPORT OF OFFICER IN CHARGE OF FORT MYER.

FORT MYER, VA., *August 15, 1884.*

GENERAL: I have the honor to submit the following report for the fiscal year ending June 30, 1884:

At the commencement of the fiscal year First Lieut. F. K. Ward, First Cavalry, acting signal officer, was on duty at this post as officer in charge and instructor, with Second Lieut. James A. Swift, Signal Corps, as assistant instructor.

On the 29th of January, 1884, I assumed charge of the post by virtue of Special Orders, No. 11, War Department, Office of the Chief Signal Officer, dated January 28, 1884, relieving Lieutenant Ward. Junior Professor Frank Waldo was assigned to duty as instructor by the same order.

Five officers, namely, First Lieut. Thomas M. Woodruff, Fifth Infantry; Second Lieut. R. B. Watkins, Signal Corps; Second Lieut. J. C. Walshe, Signal Corps; Second Lieut. B. M. Pursell, Signal Corps; Second Lieut. F. M. M. Beall, Signal Corps, were instructed in the prescribed course for officers during the year.

Lieutenants Woodruff, Watkins, and Walshe were under instruction at the commencement of the fiscal year. Lieutenants Pursell and Beall reported October 25, 1883.

Lieutenant Woodruff completed his course and was relieved from duty at this post December 20, 1883; the remaining four officers were ordered in for examination June 24, 1884. Lieutenants Watkins and Walshe completed the full course. Lieutenants Pursell and Beall had not fully completed the course in military signaling; there were remaining seventeen days of long-range practice unfinished.

Sixty-six enlisted men reported for instruction during the year. Of this number 1 was promoted to the rank of sergeant and assigned to duty as post school-teacher, 1 was assigned to duty as telegraph operator at the Office of the Chief Signal Officer, and 1 was discharged for incompetency.

On March 10, 1884, Lance Sergeant Heathcote reported for duty and was placed in charge of the observatory, being assigned to this duty by order of the Chief Signal Officer for the practical instruction of the enlisted men in station duties. Previous to this, Lieutenants Watkins, Walshe, and Pursell were detailed from time to time for this duty, but owing to their time being almost entirely taken up with their own studies and post duties but little time could be devoted to this part of the instruction for the enlisted men, and much embarrassment was caused thereby until the arrival of Sergeant Heathcote. This non-commissioned officer has been faithful in the discharge of his duties.

The theoretical and practical course of instruction, as prescribed by the Chief Signal Officer, has been closely followed, and the results have been highly satisfactory.

All enlisted men under instruction have been thoroughly drilled. The late orders of the Chief Signal Officer requiring that these men be examined as to their proficiency in drill and military appearance, by the board of examination, has had good effect in causing endeavors on the part of the men to take more pride in this part of the course of instruction.

First Sergeant Mahoney deserves credit for the manner in which he has perfected the men in drilling.

The men of the permanent party, with the exception of the older members, have not received the amount of drills usual for garrison troops, owing to the small number and urgent need for work at the post.

Last fall the quarters for the married enlisted men were put in good repair and made very comfortable. No changes have been made to other public buildings at the post further than to keep them in good repair.

Improvements of the public grounds have continued during the year, requiring a great amount of hard work, but which have been attended with good results.

The police of the post has been excellent under the immediate supervision of Police Sergeant Sullivan. He has performed his duties with credit.

All orders of the Chief Signal Officer have been literally carried out. In no other way could the improvements have been carried on so successfully and so much work accomplished.

On assuming charge of the post it was found necessary to adopt more stringent measures, with a view of compelling the renters to come up and work out their rent. Many of these people were found to be from four to six years in arrears.

Owing to the failure of Congress to provide extra-duty pay it has been difficult to obtain good men for the permanent party. Two desertions occurred during the year on this account. The post garden this year bids fair to give an abundant yield of vegetables, and no efforts have been spared to bring about this result.

Sergeant John O'Connell has remained in charge of transportation, and of the garden and farm work, and has given entire satisfaction.

Commissary Sergeant Casey has remained on duty at this post during the year. Sergeant Casey is an excellent commissary sergeant and attentive to his duties.

Sergeant Wm. H. Signor has continued as acting quartermaster sergeant, and his duties have been well performed.

Sergeant Rudolph Peters, the company clerk, was assigned to duty at the office of the Chief Signal Officer June 10, 1884, per Special Orders No. 72, in addition to his duties at this post. Sergeant Peters's papers have always been a model of neatness and correctness. The entire force comprising the permanent party have performed their duties well and satisfactorily.

I am, general, very respectfully, your obedient servant,

JAMES A. SWIFT,  
*Second Lieutenant Signal Corps.*

To the CHIEF SIGNAL OFFICER OF THE ARMY,  
*Washington, D. C.*

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## APPENDIX 3.

### REPORT OF OFFICER IN CHARGE OF THE PROPERTY AND DISBURSING DIVISION.

WASHINGTON CITY, July 15, 1884.

#### CHIEF SIGNAL OFFICER OF THE ARMY:

SIR: I have the honor to submit the following statement of the work of the property and disbursing division for the fiscal year ending June 30, 1884, as required for the annual report of the Chief Signal Officer.

No changes of importance have occurred in the personnel of the division since last report.

One hundred and thirty-four dollars and eighty cents have been received during the year from the sales of maps and other office publications as allowed by the act of Congress approved March 30, 1874.

In the "Settlement of accounts" room there have been employed a force of eleven men during the year, and in addition to the settlement of all accounts growing out of the disbursement of the regular appropriations controlled by this office, the pay accounts of the entire corps are examined, prepared for settlement and settled through this room; during the year of the former there have been nearly 9,000 accounts settled, and of the latter, 16,474 have been handled.

The methods of verifying and settling accounts in this Bureau are those prescribed by the Army Regulations and are identical with those which govern in the Quartermaster's Department, and being fixed by law no change can be made in the system.

The same Auditor and Comptroller who examine the accounts of all quartermasters examine the accounts of the disbursing officer of this office.

Many private persons, institutions of learning, &c., purchase their instruments through this office, because of the advantage afforded to obtain greater accuracy, by having the instruments compared with our standards, for which no extra charge is made. Of these there have been purchased 293 instruments at a total cost of \$1,775.30.

Five hundred and one instruments of various kinds have been purchased during the year, for the use of this service, and 847 have been issued since last report.

The average cost of maintaining each station of observation during the year, including cost of printing and additional cost of life-saving stations, exclusive of cost of telegraphic services, and the pay and allowances of the men on duty at each, has been \$404.87 against \$305.83 last year. This increase is caused from the fact that the additional cost of the printing stations and on the seacoast line were not included in the cost last year. (See Exhibit A.) From this exhibit it will be seen that while Mount Washington, N. H., cost \$1,700, Cairo, Ill., cost only \$6.55, so that although \$404.87 is given as the average cost, it is by no means to be understood that each station cost on an average that amount per annum.

While the sum total shows an apparent decrease in the letters sent and received, there has been an actual increase of 25 per cent. in the regular correspondence during the year; the difference being due to the small number of circular letters sent in comparison with former years, and the fact that three letters were formerly used in transmitting pay to enlisted men, whereas now only one is used. (See Exhibit B.)

In the packing and shipping room there were employed eight men. All property received at this office and shipped from it is handled in this room. To give an idea of the amount of work done I will state that there were over 16,000 distinct shipments made during the year.

In the machine-shop, with its adjunct, the blacksmith-shop, there have been employed five men. The usual amount of work has been done, in manufacturing and repairing meteorological instruments, &c. (For statement of work done see Exhibit C.)

The carpenter-shop furnishes all packing-boxes for shipment of supplies, and in this all wood-work and jobbing is done. One man is employed. (For statement of work done see Exhibit D.)

The library has received during the year 163 books, and now contains nearly 9,000 volumes, many of them forming the only complete set of their kind in this country, and their loss would be incalculable.

The condition of the appropriations for the fiscal year ending June 30, 1884, with the expenditures thereunder and balances unexpended at the end of the year, with probable demands on such balances as required by act of Congress approved May 1, 1829, is shown in statement herewith. (See Exhibit E.)

While the force has been increased only 11 per cent. the work has increased on an average of 30 per cent., and the great accuracy required in all work done by this division renders it essential that the most efficient and careful men be employed.

I have to say that the men now in the division, with but very few exceptions, reach the high standard of efficiency required, and the discharge of any and the employment of others in their stead except in the cases mentioned, of which a special report will be made, is not considered necessary.

As it may be of general interest I inclose a detailed statement showing the total amount appropriated for the service for the fiscal year ending June 30, 1884. (See Exhibit G.)

On April 8, 1884, the honorable Secretary of War was requested to submit to Congress an estimate for a fire-proof building for the Signal Office. (See Senate Ex. Doc. No. 152, Forty-eighth Congress, first session.) The reasons for this request were fully set forth in your letter of the above-mentioned date, and I would respectfully urge that the matter be again brought to the attention of Congress at its next session.

#### UNITED STATES MILITARY TELEGRAPH LINES.

By the relief of Second Lieut. W. A. Glassford, Signal Corps, United States Army, from charge of the Department Missouri Division United States military telegraph lines, November 30, 1883; of Second Lieut. L. E. Sebree, Signal Corps, United States Army, from charge of the Texas Division, December 31, 1883; and of Second Lieut. Frank Greene, Signal Corps, United States Army, from charge of the Washington and Idaho Division, May 31, 1884, the duty of accounting for line receipts and public property on these lines devolved upon the property and disbursing officer.

The stations on these lines are as follows:

#### DEPARTMENT MISSOURI DIVISION.

Carter, Wyo.	Fort Reno, Ind. T.
Cantonment, Ind. T.	Fort Supply, Ind. T.
Dodge City, Kans.	Fort Elliott, Tex.
Durango, Col.	Fort Craig, N. Mex.
Florida, N. Mex.	Fort Stanton, N. Mex.
Fort Cummings, N. Mex.	Henrietta, Texas.
Fort Union, N. Mex.	Montrose, Colo.
Fort Lewis, Colo.	San Marcial, N. Mex.
Fort Bridger, Wyo.	Uncompahgre, Colo.
Fort Thornburg, Utah.	Watrous, N. Mex.
Fort Sill, Ind. T.	

#### TEXAS DIVISION.

Fort Stockton, Tex.	Brownsville, Tex.
Fort Davis, Tex.	Rio Grande City, Tex.
San Antonio, Tex.	Marfa, Tex.

#### WASHINGTON AND IDAHO DIVISION.

Ashland, Oreg.	Fort Lapwai, Idaho.
Astoria, Oreg.	Lakeview Oreg.
Crescent Bay, Wash.	Lewiston, Idaho.
Dayton, Wash.	Linkville, Oreg.
Fort Bidwell, Cal.	Neah Bay, Wash.
Fort Canby, Wash.	Port Angelo, Wash.
Fort Cœur d'Alene, Idaho.	Pysht, Wash.
Fort Klamath, Oreg.	Spokane Falls, Wash.
Fort Spokane, Wash.	Tatoosh Island, Wash.

A total of forty-five stations, or an increase of over 30 per cent. in the property accountability at this office. As the Washington and Idaho Division was but recently transferred, the full force of this increased work is not yet felt. It is hoped an adequate increase of force will be allowed the division.

The short lines in the Department of the Missouri, connecting Forts Union, Cummings, Lewis, and the cantonment on the Uncompahgre with the railroad, were fitted out with telephones and turned over to the post commanders, who were given discretionary powers as to the transaction of commercial business. No tolls for such business were to be charged, however, and no returns are made by the persons in charge of the terminal offices.

The duty of collecting line receipts, settling accounts for business transferred to connection lines, examining and correcting telegraph accounts and preparing these accounts for transmission to the Treasury Department, is one requiring much attention, and involving, as they do, a large monetary responsibility, is one in which too much care cannot be exercised.

The orders relating to the remittance of line receipts, in force upon these lines at the time of transfer, were continued, and such additional orders as became necessary were issued from time to time. Under General Order No. 57, series 1883, operators in charge are required to remit the receipts of their offices when the sum on hand reaches \$20.

The receipts from these lines have been collected and covered into the Treasury, without the loss to the United States of a cent. This is a noteworthy feature, considering the extent of territory covered, the isolated position of stations and the poor facilities many of the operators have of transmitting money to this point.

While the amount of money collected on these lines is not as large as in former years, it is evident that an equal amount of care and labor is required to account for it.

It is especially urged that steps be taken toward providing for a means of remitting line receipts, whereby the risk of loss will be reduced to the minimum, and I would suggest that Congress be asked to allow the expense of transmitting line receipts to be paid therefrom. There have been no losses during the past year on account of failures in the mail service, but should a single registered package be lost the contents are irrecoverable. And, as most of the remittances contain money for other lines, the way to a settlement of their claim under the present law is not plain.

A change in the system of settling accounts for telegraph business transferred to connecting lines was made necessary, by the rulings of the auditing officers of the Treasury Department upon section 3477 Revised Statutes.

Twelve hundred and thirty-six telegraph reports have been received and examined since November last. It is noticed that men from Fort Myer, Va., are entirely ignorant of the system of keeping telegraph accounts. It is recommended that such system be included in the course of instruction at the above-named post.

The receipts from lines in Department of the Missouri from November, 1883, to June 30, 1884, were \$3,446 73  
 Department of Texas from December 1, 1883, to June 30, 1884 2,004 07  
 Washington and Idaho Division for June, 1884 507 92

A total of 5,958 72

Of which amount \$3,427.38 must be deducted for other lines

The money value of free business done on these lines for the Executive Departments during the same period is \$2,036.32.

I am, very respectfully, your obedient servant,

S. M. MILLS,

Captain Fifth Artillery, P. & D. Officer Signal Service, U. S. A.

#### EXHIBIT A.

#### Cost of Signal Service stations for the year ending June 30, 1884.

Station.	Amount.	Station.	Amount.
Albany, N. Y.	\$944 97	Burlington, Iowa	\$591 55
Alpena, Mich.	326 48	Block Island, R. I.	232 76
Atlanta, Ga.	291 46	Cairo, Ill.	6 55
Atlantic City, N. J.	423 96	Cape Henry, Va.	35 18
Augusta, Ga.	240 11	Cape May, N. J.	446 08
Baltimore, Md.	504 92	Cape Mendocino, Cal.	590 13
Bangor, Me.	417 62	Cedar Keys, Fla.	230 73
Barnegat City, N. J.	281 31	Charleston, S. C.	177 37
Boise City, Idaho	435 73	Charlotte, N. C.	224 98
Boston, Mass.	960 80	Chattanooga, Tenn.	328 10
Buffalo, N. Y.	1,347 77	Cheyenne, Wyoming	401 35

# REPORT OF THE CHIEF SIGNAL OFFICER.

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Cost of Signal Service stations for the fiscal year ending June 30, 1884—Continued.

Station.	Amount.	Station.	Amount.
Chicago, Ill.	\$1,068 84	New River, N. C.	\$145 60
Chincoteague, Va.	45 55	New York, N. Y.	675 00
Cincinnati, Ohio	705 51	Norfolk, Va.	607 18
Cleveland, Ohio	433 63	North Platte, Nebr.	451 12
Columbus, Ohio	282 57	Ocean City, Md.	95 27
Colorado Springs, Colo.	992 54	Olympia, Wash.	174 52
Davenport, Iowa	320 02	Omaha, Nebr.	142 12
Delaware Breakwater, Del.	541 76	Oswego, N. Y.	287 22
Denver, Colo.	296 78	Pensacola, Fla.	477 03
Des Moines, Iowa	466 60	Philadelphia, Pa.	839 86
Detroit, Mich.	980 64	Pike's Peak, Colo.	1,401 82
Dodge City, Kans.	49 09	Pittsburg, Pa.	733 31
Dubuque, Iowa	305 87	Point Judith, R. I.	44 11
Duluth, Minn.	402 83	Port Huron, Mich.	173 15
Eastport, Me.	320 29	Portland, Me.	168 25
Erie, Pa.	414 88	Portland, Ore.	276 05
El Paso, Tex.	820 56	Provincetown, Mass.	410 91
Escanaba, Mich.	551 51	Palestine, Tex.	47 64
Fort Mason, N. C.	228 11	Red Bluff, Cal.	188 07
Fort Smith, Ark.	113 13	Rochester, N. Y.	186 28
Galveston, Tex.	162 22	Roseburg, Ore.	218 00
Grand Haven, Mich.	312 82	Sacramento, Cal.	279 83
Hatteras, N. C.	102 49	Salt Lake City, Utah	392 73
Huron, Dak.	332 29	Sandusky, Ohio	306 31
Indianapolis, Ind.	280 53	Sandy Hook, N. J.	77 89
Indianola, Tex.	329 69	Saunder, Fla.	312 23
Jacksonville, Fla.	240 73	San Francisco, Cal.	425 78
Keokuk, Iowa	319 47	Savannah, Ga.	301 49
Key West, Fla.	365 17	Shreveport, La.	264 00
Kitty Hawk, N. C.	28 32	Scott's Hill, N. C.	204 38
Knoxville, Tenn.	123 81	San Diego, Cal.	371 18
La Crosse, Wis.	243 71	Smithville, N. C.	115 85
Leavenworth, Kans.	722 07	Springfield, Ill.	70 91
Little Egg Harbor, N. J.	12 00	Saint Louis, Mo.	1,718 30
Logansport, Ind.	376 86	Saint Paul, Minn.	369 11
Los Angeles, Cal.	841 24	Saint Vincent, Minn.	422 11
Louisville, Ky.	282 08	Sitka, Alaska.	589 15
Lynchburg, Va.	258 44	Thatcher's Island, Mass.	177 60
Little Rock, Ark.	474 87	Toledo, Ohio	178 55
MacKinnaw City, Michigan.	282 16	Vicksburg, Miss.	340 20
Marquette, Mich.	282 60	West Las Animas, Colo.	284 35
Memphis, Tenn.	552 44	Wilmington, N. C.	361 81
Milwaukee, Wis.	634 64	Wash Woods, N. C.	68 42
Mobile, Ala.	297 25	Yankton, Dak.	350 23
Montgomery, Ala.	307 80	Yuma, Ariz.	125 40
Montross, Minn.	430 42	Unalaska Island, Alaska	290 32
Mount Washington, N. H.	1,715 78		
Narragansett Pier, R. I.	364 15		
Nashville, Tenn.	889 00		
New London, Conn.	287 88		
New Haven, Conn.	351 77		
New Orleans, La.	118 85		
		Coast telegraph	46,727 15
			1,857 50
		Grand total	48,584 65

This statement does not include any expenses for Washington, D. C.

## Cost of Sea-Coast Telegraph Line for fiscal year ending June 30, 1884.

Station.	Amount.	Station.	Amount.
Atlantic City, N. J.	\$311 28	Narragansett Pier, R. I.	82 18
Barnegat, N. J.	40 15	Norfolk, Va.	119 51
Block Island, R. I.	32 73	Ocean City, Md.	61 64
Cape Lookout, Va.	4 00	Portsmouth, N. C.	29 18
Cape Henry, Va.	61 53	Point Judith, R. I.	21 55
Cape May, N. J.	61 91	Sloop Point, N. C.	148 00
Chincoteague, Va.	19 42	Sandy Hook, N. J.	28 43
Delaware Breakwater, Del.	37 09	Smithville, N. C.	50 72
Fort Mason, N. C.	87 82	Thatcher's Island, Mass.	57 27
Hatteras, N. C.	170 99	Wash Woods, N. C.	3 12
Kitty Hawk, N. C.	148 00	Wilmington, N. C.	115 45
Little Egg Harbor, N. J.	112 64	Miscellaneous	18 60
Manassas, N. J.	19 86		
New River, N. C.	118 09		
		Total	1,857 50



The following stations that were included in last year's statement of expenses were discontinued during latter part of fiscal year ending June 30, 1883, and fiscal year ending June 30, 1884:

Burlington, Vt.	Punta Rasa, Fla.
Cape Lookout, N. C.	Springfield, Mass.
Champaign, Ill.	Springfield, Mo.
Denison, Tex.	Starkville, Miss.
Eagle Rock, Idaho.	Sante Fé, N. Mex.
Fort Washakie, Wyo.	Tucson, Ariz.
Madison, Wis.	Umatilla, Oreg.
Morgantown, W. Va.	Visalia, Cal.
Manasquan, N. J.	Winnemucca, Nev.
Newport, R. I.	Williamsport, Pa.
Pioche, Nev.	

## EXHIBIT B.

*Letters sent during year ending June 30, 1884.*

H heads of Departments and Bureaus .....	2,065
Manufacturers and others .....	2,475
Enlisted men, relating to property and money .....	12,203
Enlisted men, authorizing purchases and expenditures .....	1,792
Miscellaneous .....	12,993
<b>Total .....</b>	<b>31,528</b>

*Letters received during year ending June 30, 1884.*

H heads of Departments and Bureaus .....	3,908
Manufacturers and others .....	1,563
Enlisted men, relating to property and money .....	19,336
Miscellaneous .....	7,712
<b>Total .....</b>	<b>32,519</b>

## EXHIBIT C.

*Abstract of articles made and repaired in machine-shop during fiscal year ending June 30, 1884.*

Articles.	Number.	Articles.	Number.
<b>MADE.</b>		<b>REPAIRED.</b>	
Anemometers, special pattern .....	6	Anemometer cups, regular .....	41
Anemometers, cups, sets of special pattern .....	12	Anemometers, regular .....	86
Anemometers, cups, regular .....	65	Anemometers, self-registering .....	31
Arrows for weather maps, old style .....	5,000	Adders, Webb's .....	3
Arrows for weather maps, sets of new style .....	15	Barometer boxes, new style .....	25
Bulletin-board springs .....	415	Call boxes for telephones .....	80
Bed plate (brass) for printing weather maps .....	1	Clocks, regulator and marine .....	18
Contact and attachment for wind vane .....	4	Heliographs .....	2
Clock works for self-register .....	8	Heliograph screens .....	15
Dies, set of, for stamping weather maps .....	1	Horizon instrument .....	1
Hygrometer springs .....	110	Marine glasses .....	6
Heliograph screen, new pattern .....	1	Rain-gauges (copper) .....	12
Instrument shelters (galv. iron) .....	9	Telephones .....	115
Radiation thermometer supports .....	50	Telephone transmitters .....	40
Rain gauges (galv. iron) .....	18	Telegraph keys .....	94
Switches, telephone .....	8	Telegraph sounders .....	46
Telephones .....	46	Telegraph-box sounders .....	24
Telephones, transmitters .....	25	Telegraph relays .....	22
Telescope holders .....	12	Telegraph repeaters .....	6
Wind vanes, complete .....	8	Telegraph instruments, field .....	4
Weather cases, complete .....	10	Telescopes .....	4
		Telescope holders .....	4
		Thermometer-testing apparatus .....	2
		Thermometer cases for water thermometer .....	12
		Telescopic rods for anemometer .....	2
		Wind vane .....	1

In addition to the above there have been repairs to machinery in printing office, and general repairs in the buildings, such as plumbing, gas-fitting, locksmithing, &c.

## EXHIBIT D.

*Abstract of carpenter work during fiscal year ending June 30, 1884.*

Articles.	Number.	Articles.	Number.
<b>MADE.</b>		<b>REPAIRED—Continued.</b>	
Shelters .....	43	Ladder .....	1
Boxes .....	896	Ice picks .....	2
Box tops .....	88	Stands .....	15
Box cleats .....	24	Telegraph board .....	1
Cl rates .....	48	Drawer .....	1
Wind vanes .....	4	Barometer boxes .....	94
Anemometer posts .....	2	Water cooler .....	1
Rain-gauge rules .....	247	Wind vane .....	1
Drawing boards .....	4	Windows .....	6
Map sticks .....	14	Tables .....	11
Stands .....	8	Window shades .....	5
Doors .....	4	Fire screens .....	5
Label boards .....	40	Bed .....	1
Cutting sticks .....	12	Pigeon holes .....	24
Thermometer stands .....	4	Wheelbarrow .....	1
Ladders .....	6	Galleys (printing office) .....	3
Chest .....	1	Bulletin frames .....	51
Blocks (printing office) .....	35	Thermometer boxes .....	32
Pigeon holes .....	151	Anemometer boxes .....	5
File boards .....	4	Heliograph boxes .....	2
Cable boxes .....	3	Crates .....	2
Warning boards .....	80	Blind .....	1
File screen .....	1	Sign boards .....	4
Wrapping boards .....	3	Stone racks .....	2
Benches .....	3	Sash cords .....	34
Hygrometer boards .....	76	Switch boards .....	2
Bulletin boards .....	200	Press .....	1
Stool .....	1		
Thermometer racks .....	32	<b>MISCELLANEOUS.</b>	
Circular mounting .....	1	Trunks boxed .....	3
Anemometer stands .....	2	Chair boxed .....	1
Telegraph boards .....	55	Scrapers sharpened (printing office) .....	6
Thermometer boxes .....	32	Clock hung .....	1
Telegraph covers .....	116	Coat racks put up .....	10
Water dash .....	1	Signs put up .....	2
Barrel cover .....	1	Hinges put on .....	2
Rack for telegraph wires .....	1	Doors hung .....	6
Anemometer boxes .....	2	Cases painted .....	7
Tables .....	2	Maps mounted .....	8
Wand sticks .....	100	Locks put on .....	8
Hand rail .....	1	Warning boards varnished .....	6
Foot rests .....	2	Knobs put on .....	4
Cautionary signal board .....	1	Bulletin boards painted .....	200
		Door cut in partition .....	1
<b>REPAIRED.</b>		Bulletin boards varnished .....	100
Chairs .....	57	Hygrometer boards oiled .....	110
Stools .....	3	Instrument shelter put up .....	1
Doors .....	11	Telegraph boards varnished .....	58
Desks .....	16	Shelters painted .....	35
Rollers (printing office) .....	2	Shelters crated .....	6
Blocks (printing office) .....	1	Blackboard painted .....	1
Cases .....	10	Flag pole put up .....	1
Fly sticks .....	5		

In addition to the above, there has been considerable work done, such as repairing roofs and floors, laying board walks in yard, taking down and putting up water closets, &c., and there has been one man employed on carpenter work at Fort Myer, Va., from April 15 to June 30, 1884.

## EXHIBIT E.

*Appropriations made for 1883-'84.*

Observation and report of storms .....	\$242,500 00
Expenses Signal Service, U. S. A .....	5,000 00
Maintenance, &c., military telegraph lines .....	35,000 00
Observation and exploration in Arctic seas .....	33,000 00

## REPORT OF THE CHIEF SIGNAL OFFICER.

*Expended to June 30, 1884.*

Observation and report of storms .....	\$165,377 68
Expenses Signal Service, U. S. A .....	1,754 23
Maintenance, &c., military telegraph lines .....	23,840 35
Observation and exploration in Arctic seas .....	32,340 20

*On hand July 1, 1884.*

Observation and report of storms .....	\$77,122 32
Expenses Signal Service, U. S. A .....	3,245 77
Maintenance, &c., military telegraph lines .....	11,159 66
Observation and exploration in Arctic seas .....	659 80

*Liabilities against above balances (estimated).*

Observation and report of storms .....	\$74,000 00
Expenses Signal Service, U. S. A .....	3,000 00
Maintenance, &c., military telegraph lines .....	11,159 65
Observation and exploration in Arctic seas .....	400 00

## EXHIBIT F.

*Names of enlisted men and of civilians ordered to and transferred, &c., from property division since June 30, 1883.*

## ORDERED TO DIVISION.

Enlisted men.	Enlisted men.	Civilians.	Civilians.
Duane, Louis. Moran, James. Henry, A. J. Johnson, F. L. Spates, R. N. Farrel, S. J. Riviere, G. A.	Moran, Jno. A. Detohmenny, G. A. Whiteside, J. L. Koonce, G. W. Marye, W. B. Rennie, J. W.	Crews, E. Cross, C. F. Penn, G. Plummer, W. Finn, W. Collier, L. Lee, W. J.	Finn, B. F. Marston, Geo. Jackson, A. S. Rawlings, G. W. Hittobina, H. Branham, W. A.

## TRANSFERRED, ETC., FROM DIVISION.

Green, Geo. P. Ferry, Geo. N. Sawyer, C. J. Frear, J. A. Harrison, R. H.	Morsell, J. W. Haas-Hagen, J. G. Lyons, D. Wagg, A. M.	Rowe, G. DeKnight, C. Dyer, W. Harris, M. Jenifer, H.	Hayes, R. W. Tulley, C. W. Rawlings, G. W. Branham, W. A.
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## RECAPITULATION.

Enlisted men.	Number.	Civilians.	Number.
Ordered to division since June 30, 1883.	13	Ordered to division since June 30, 1883.	13
Transferred from division since June 30, 1883 .....	9	Transferred from division since June 30, 1883 .....	9
Gain since June 30, 1883 .....	4	Gain since June 30, 1883 .....	4

*Comparative statement showing number of men employed in property and disbursing division, Signal Service, U. S. A., on July 1, 1883, and on June 30, 1884.*

	Enlisted men.	Civilians.	Total.
Number of men in division July 1, 1883 .....	26	20	46
Number of men in division June 30, 1884 .....	40	44	84

## EXHIBIT G.

*Statement of amounts appropriated for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1884.*

## LEGISLATIVE, EXECUTIVE, AND JUDICIAL.

Regular clerks, messengers, &c.....	\$10,600 00
Scientific experts, clerks, &c.....	40,000 00
Postage-stamps, Postal Union countries, allotted by the Secretary of War.....	1,200 00
Stationery allotted by the Secretary of War.....	8,400 00
Rent of buildings for Signal Office.....	2,000 00
Official postage allotted by Secretary of War.....	40,000 00
Fuel and light allotted by Secretary of War.....	1,107 24
<b>Total</b> .....	<b>103,367 24</b>

## SUNDRY CIVIL EXPENSES.

Observation and report of storms:	
Manufacture, purchase, and repair of instruments.....	\$5,500 00
Telegraphing reports.....	136,000 00
Expenses storm signals.....	10,000 00
Cotton-belt reports.....	7,000 00
Connection life saving stations.....	5,500 00
Instrument shelters.....	500 00
Rents, &c., of offices outside of Washington.....	40,000 00
Office furniture in Washington.....	1,000 00
River and flood reports.....	5,000 00
Maps and bulletins.....	25,000 00
Books, periodicals, and stationery.....	6,000 00
Incidental expenses.....	1,000 00
<b>Total</b> .....	<b>242,500 00</b>

Maintenance and repair of military telegraph lines.....	35,000 00
Observation and exploration in the Arctic seas.....	32,600 00

## Pay, &amp;c., of the Signal Corps:

Pay of officers.....	\$19,500 00
Pay of enlisted men.....	200,000 00
Mileage to officers.....	5,900 00
Pay of contract surgeons.....	3,600 00
Commutation of quarters to officers.....	7,000 00
<b>Total</b> .....	<b>235,100 00</b>

## Subsistence Department:

Stores, Lady Franklin Bay.....	\$5,000 00
Stores, Point Barrow.....	3,000 00
Subsistence and commutation rations, Signal Corps.....	148,727 72
Commutation of rations, men with expeditions.....	8,052 00
<b>Total</b> .....	<b>164,779 72</b>

## Quartermaster's Department—Regular supplies:

Fuel.....	\$6,295 00
Commutation of fuel, at \$9 per month.....	23,760 00
Commutation of fuel, at \$8 per month.....	23,324 00
Forage for mules and horses.....	3,100 00
Stationery.....	100 00
Stoves.....	706 25
Lights.....	362 50
<b>Total</b> .....	<b>57,651 75</b>

**Quartermaster's Department—Incidental expenses:**

Horse and mule shoes .....	\$500 00
Blacksmiths' tools .....	550 00
Veterinary supplies .....	300 00
Fire-apparatus, disinfectants, &c .....	125 00

Total .....	1,475 00
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**Quartermaster's Department—Transportation:**

Supplies, &c .....	\$25,000 00
Officers and men .....	8,875 00
Means of, mules .....	700 00
Means of, spring-wagon .....	200 00
Means of, repairs to .....	500 00

Total .....	35,275 00
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**Quartermaster's Department—Barracks and quarters:**

Commutation of quarters .....	\$84,108 00
Work and supplies at Fort Myer .....	1,800 00

Total .....	85,908 00
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**Quartermaster's Department—Clothing, camp, and garrison equipage:**

For sergeants .....	\$6,937 50
For corporals .....	1,375 20
For privates .....	14,182 40
For detailed men .....	990 00

Total .....	23,485 10
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**Medical Department:**

Medical attendance and medicines, officers and men, Signal Corps .....	\$3,500 00
Medical attendance and medicines, officers with Signal Corps .....	100 00
Medical and hospital supplies, Fort Myer .....	900 00
Medicines from depots, &c .....	1,000 00
Material, repairs to hospital, Fort Myer .....	200 00

Total .....	5,700 00
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**Support of the Army:**

Expenses Signal Service, U. S. Army .....	\$5,000 00
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Grand total .....	\$1,028,241 81
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## APPENDIX 4.

### REPORT OF THE ASSISTANT IN CHARGE OF THE STUDY ROOM.

STUDY ROOM, OFFICE OF THE CHIEF SIGNAL OFFICER,  
August 7, 1884.

TO THE CHIEF SIGNAL OFFICER:

SIR: I have the honor to report that during the past year the *personnel* of the study-room has experienced important changes, as follows:

On January 10, 1884, Prof. Winslow Upton resigned his position in order to accept a position at Brown University, Providence, R. I. I anticipate that he will there be able to accomplish much for the advance of meteorology.

On January 14, Sergeant (now Lieutenant) Finley, then in charge of the collection and study of tornado data, reported to the study-room for duty, and has continued his work in this line. The other additions have been as follows: January 21, Privates G. W. Knopf and O. L. Fassig; March 7, Mr. C. J. Sawyer, bibliographer; April 8, Corporal Daniels; May 26, Private Hilton; June 10, Sergeant R. Peters, for one-half of each day; June 11, Sergeant Marbury; June 21, Private Dilley; June 24, Private J. Hall.

On February 27, Private King reported, but was transferred on March 28 to station duty; March 10, Sergeant Schaeffer reported, but was transferred, April 8 to the marine division.

There has therefore been a net increase of three men, and there are now eight, as compared with five at the beginning of the year. With this has come a more than corresponding increase in the amount of work done.

The details of the work that has passed through the study-room is about as follows:

#### CONSULTING SPECIALISTS.

During the year the following well-known experts have been consulted with reference to special matters:

On atmospheric electricity, Prof. H. A. Rowland, of Baltimore, and Prof. John Trowbridge, of Cambridge, Mass.

On atmospheric spectroscopy, Prof. C. S. Hastings, of Baltimore, Prof. S. C. Pickering, of Cambridge, Prof. W. Upton, of Providence, R. I., and Prof. C. S. Cook, of Hanover, N. H.

On barometry, Prof. A. W. Wright, of New Haven.

On chemical analysis of the air, Prof. E. W. Morley; earth temperatures, Prof. T. C. Mendenhall and Prof. Trowbridge.

On bibliography, numerous meteorologists, among whom may be mentioned Dr. Julius Hann, Dr. Geo. Hellman, Dr. A. Lancaster, Dr. F. B. Hough, Prof. Elias Loomis, from each of whom valuable assistance has been received. It is specially gratifying to be able to add that the latter has consented to compile a summary of the results embodied in his twenty memoirs entitled "Contributions to Meteorology," with much additional matter, for publication as a professional paper. These laborious studies of Signal Service tri-daily weather-maps cannot but prove of value to the service.

#### STANDARDS.

(a) *Thermometers and exposures.*—The work done on this subject has consisted in the extensive investigations made by Professor Hazen into the proper exposure of thermometers. His observations are still in progress. The office has already profited by his preliminary results.

It is considered desirable that temperatures in mid-air should be obtained by means of small captive balloons, and that the sling thermometer as corrected by Professor Ferrel's new formulæ be recognized as our ultimate standard for temperature of dry and wet bulbs.

(b) *Barometers*.—The principal work under this head has been the continuation of the comparative observations made by Professor Waldo into the relation between the Signal Service and foreign standards. Six new portable Fuess barometers have been compared with others both abroad and in this country, but completion of the work has been delayed by Professor Waldo's sickness.

The extensive experiments made by Prof. A. W. Wright looking to the construction of a normal barometer have been brought to a satisfactory conclusion, and it is desirable that this office obtain a duplicate of his apparatus.

According to Hagemann's and other experiments, barometers may be sensibly affected by their exposure in rooms subject to strong chimney and window draughts. I have devised an anemo-barometer to test this question, and recommend that a trial of it be made.

(c) *Hygrometers*.—The contemplated investigation of hygrometric apparatus, and especially of Regnault's formula, has been delayed by the resignation of Professor Upton. The special observations made at Pike's Peak, Colorado Springs, and Yuma, have been discontinued, and the results will be deduced as soon as a competent person is available. The use of some form of ventilating apparatus for the wet bulb was recommended by me in a report dated October 18, 1883; probably the sling thermometer should be now recognized as the least objectionable method of obtaining such ventilation.

(d) *Anemometers*.—The sample anemometers sent last year to the Deutsche Seewarte for the purpose of comparison with European standards have, it is understood, already been compared, but no report of results has yet been received. It is very important that this office should possess the apparatus known as "a whirling table," or its equivalent, and the proper room for its use, in order that all of our instruments may be tested up to velocities of at least 40 miles an hour. For the higher velocities and for all forms of pressure apparatus there are still needed elaborate theoretical and experimental investigations. The high velocities (maximum 186 miles hourly) habitually reported by our instruments at Mount Washington, Cape Hatteras, &c., impose upon us the responsibility of thoroughly establishing the reliability of these figures. To do this it will be necessary to make a considerable outlay of time and money, and I recommend that steps be taken to secure the necessary authority. The neighborhood of Cape Hatteras offers an excellent location for beginning this work. In order to test the exposures on Mount Washington, I have recommended that two anemometers be placed on the signal tower, for which purpose the owner of the tower has kindly offered every facility.

(e) *Rain-gauge and exposure*.—I have during the past year recommended that the 8 inch gauge so long used by this service be considered as our standard, so far at least as the diameter of the mouth is concerned, and that each station be supplied with two such gauges; any others that have been supplied should be considered as experimental.

In order to study the effect of exposure in its narrowest sense comparative observations of two gauges were ordered to be made at fifty stations; the results thus far deduced from the study of these records show a disagreement in extreme cases of 50 per cent., but it is not yet ascertained how much of this is due to location and how much to the form of the gauge.

The special series of observations on Mount Washington, intended as a contribution to the question of distribution of rainfall on mountain sides, has thus far shown that within distances of only a few hundred feet on the summit there are systematic differences in the amount of rainfall due to the direction and velocity of the wind. The discrepancies between the readings of the different gauges observed increase with the velocity of the wind, the leeward gauges containing the greater rainfall.

Steps have been taken to establish at an early day a new series of rain-gauges on the east and west sides of the mountain at altitudes differing about 500 feet.

By these means the rainfall at the summit will be connected with the records of surrounding base stations, and the law of variation of rainfall with elevation may be obtained.

(f) *Standard time*.—The standard clock made for this office by the American Watch Company at Waltham, after running for one year on trial, has been allowed to stop, and preparations are being made to send it to Waltham for slight improvements, which will be made by the maker without charge to this office.

The necessity of having time-scales mutually agreeing to within a second has been recently again enforced by Professors Rowland and Trowbridge in order that they may successfully elucidate the sudden changes recorded in electric registers; some of these changes are possibly records of earthquake shocks and tremors, and the successful establishment of such records at many Signal Service stations will undoubtedly facilitate the study and eventually the prediction of earthquakes—if we may judge from the great advances made in seismology during the last fifteen years.

The steps taken by the United States Government toward securing an international convention on the question of a prime meridian and standard time have resulted in fixing October 1 as the date on which the convention is to be held, and with your

permission I have accepted a position as delegate. Although the legalization and general adoption of the system of hourly meridians from Greenwich has already taken place in the United States, yet it has not been proper for this office to relinquish the use of Washington local time until all co-operating national systems of meteorology could agree thereto; all the replies to a circular upon this subject have shown perfect unanimity, and it is therefore expected that, beginning with January 1, 1885, our observations will be taken simultaneously throughout the world on the even hours of an international time system.

#### TABLES FOR REDUCTIONS AND CONVERSIONS.

The tables for derivation of dew-point and humidity, based on Regnault's formula for the psychrometer, have been extended and continued in use, but new tables will be prepared as soon as the formula has been modified so as to agree with recent data, especially the observations at Pike's Peak and Yuma. A table for relative humidity at ordinary pressures has been completed for use, especially at sea.

The tables of monthly constants for reduction of the barometer to sea-level continue in use, without important change (see paper A). The only considerable contribution to our knowledge of this subject that has been published during the year consists in the memoir recently read by Professor Loomis before the National Academy of Sciences. It is by all acknowledged to be very desirable that some more satisfactory method of reduction should be devised, and especially that there should be uniformity in this matter among all the meteorological offices of the world.

An elaborate table of longitudes and times has been prepared and published in order to facilitate the securing of simultaneity of meteorological observations at all Signal Service and international stations.

#### CONFORMITY TO THE RESOLUTIONS OF THE INTERNATIONAL METEOROLOGICAL CONGRESS.

The International Congress at Vienna in 1873, and that subsequently held at Rome in 1878, having, through their permanent meteorological committee, framed a system of rules and forms, and having voted unanimously that the progress of meteorology required as close conformity to these as any way possible, I have, by your order and with the assistance of Professor Upton, submitted a report recommending such changes in Signal Service methods as seemed desirable and practicable.

These changes, having been approved by you, have already partially gone into effect, but other important points need further consideration. Among these is the matter of continuous self-registers, as touched upon in the following paragraph:

#### STATIONS OF THE FIRST ORDER.

In order to combine together records made from three to six times a day, and in order to study minutely the changes going on in the atmosphere, a few stations are necessary at which continuous, or at least hourly, records are maintained. The absence of such stations in this country has been greatly deplored by meteorologists, and I earnestly recommend that one such be established at once at Fort Myer and be furnished with conveniences for special investigations into such matters as cannot be easily studied in this city, as, for example, anemometry, electricity, and cloud photography.

#### RELIABILITY OF STATION BAROMETERS.

Until May 10, 1884, it was the duty of this room to compare the extracts from the reports of inspecting officers and other forms and data relating to the correctness of station barometers, and to suggest the proper action wherever any deterioration was detected.

This work was confided to Professor Hazen, and his report on its condition up to June 30, when turned over to the Meteorological Observatory by him, gives all necessary details.

As much trouble has been caused by the deterioration of barometers incident upon the removal of instruments from one building to another, special instructions for such removals and a form for comparative readings have been prepared by the study-room, and upon recommendation adopted.

#### LOCATIONS OF STATIONS.

(a) *Latitude and longitude.*—In order to secure greater accuracy in the locations of stations it has been recommended that each report its distance in miles north or south and east or west of some prominent public building or geodetic point of reference



whose location is accurately known. It thus becomes possible to distinguish between the stations of various observers when several are located in the same city or when an office has been frequently moved.

(b) *Altitudes*.—When possible the altitudes of all our stations depend upon rail-road, canal, or geodetic leveling; more accurate data is continually being received, and the present condition of our knowledge is shown in paper B, which is extracted from a report of Professor Hazen, who has had charge of the altitudes of instruments, river-gauge zeros, reference planes, &c.

#### ATMOSPHERIC ELECTRICITY.

The system of study and observation inaugurated in August, 1882, under the general direction of Professors Rowland and Trowbridge, has continued and satisfactory progress is reported.

By your direction I visited these stations in the last week of June, and my report thereon shows the following results.

(a) *Baltimore electric station*.—Professor Rowland has set apart a room in the physical laboratory of the Johns Hopkins University and offered all possible photographic facilities for establishing and maintaining the Mascart self-registering apparatus.

After overcoming many difficulties this has now for several months been made to keep a satisfactory record, and Private Morrell has presented a memoir of preliminary results, which, on the recommendation of Professor Rowland, has been accepted and ordered to be published.

(b) *Cambridge electric station*.—Professor Trowbridge has instructed Privates McAdie and McRae and has, out of apparatus loaned by Harvard University, arranged for continuous photographic registration of electrical conditions and ground currents. A room in the Lawrence Scientific School has been assigned for the use of these observers, but much more desirable room will be given them in the new "Thayer" physical laboratory. Private McAdie has prepared a memoir on some results of the first year's work, which it is expected will soon be submitted to you by Professor Trowbridge.

As both of these stations have now begun continuous observations, it is desirable that they should be recognized as distinct electrical stations.

It is probable that eventually similar stations will be advisable at other scientific schools where the physical laboratories and the electrical experts are at hand.

In all cases the men and apparatus at such stations should, if possible, be under the control of electricians whom we recognize as *consulting specialists*.

(c) *International Congress of Electricians*.—At the request of the International Congress of Electricians this office has undertaken to stimulate a general interest in this subject and to secure the co-operation of professional electricians, telegraph, telephone, and electric-light companies. Encouraging responses have been received from all these, and a general convention on the subject will probably be held at an early date. It is believed that especially through the telephone companies it will become possible to predict and rapidly notify any community of approaching thunder-storms. In fact, by means of this co-operation it may become possible to make daily a somewhat minute survey of the electric condition at the earth's surface parallel in every respect to the magnetic survey that has already been achieved by international effort.

The observations of ground currents, made with rather rough apparatus by Lieut. Ray at Ooglaamie, have been turned over to Professor Trowbridge, who will supervise their reduction by Private McRae.

#### RAIN BAND SPECTROSCOPY.

About the beginning of the present fiscal year a series of spectroscopic observations was begun as referred to in my last Annual Report. These have now been continued for over a year at five stations, but, owing to the resignation of Professor Upton and the delay in appointing a successor, no definite study of these observations has been made. It is, however, probable that owing to the roughness of this method of observation (recommended originally by foreign meteorologists) it will, as was partly anticipated, not give results sufficiently valuable to warrant its general introduction into the Signal Service. On the other hand, an improved apparatus and method devised by Professor C. S. Cook, of Hanover, N. H., seems worthy of trial, and I have recommended that sufficient apparatus to furnish three stations be purchased.

#### EARTH TEMPERATURES.

The temperature of the earth at depths greater than 3 feet has generally been recognized as an important contribution to our knowledge of climate and its secular changes; but temperatures at depths of from 4 inches to 3 feet form a still more valuable contribution to the study of agriculture and forestry, while the temperatures at the immediate surface are an index of any rapid changes in solar and terrestrial radiation. Observations of the temperature have therefore been requested by Professor Langley as a check upon the results of his observations on Mt. Whitney.

Earth temperatures at ordinary depths have been suggested as desirable by Professor Mendenhall, of Columbus, Ohio, in connection with the progress of agriculture, and also by Professor Trowbridge, of Cambridge, in connection with ground currents and atmospheric electricity proper.

I consider it desirable that ground currents and earth temperature should be recorded at both these stations continuously as preliminary to more extensive work in this line.

#### SOLAR RADIATION.

The Arago-Davy actinometers purchased of an English maker, for the observation of solar-radiation at twenty stations, having been carefully compared, have been reported upon adversely, on the ground that the ordinary thermometers in vacuo are decidedly preferable to the maximums used by English observers. The maker having stated on what conditions he will make the necessary changes, I have recommended the substitution of ordinary for maximums.

In order that we may have actinometric standards conformable to the conditions demanded by Professor Ferrel's researches, I have with him drawn up the necessary specifications, and standard instruments have been ordered of Professor Marié Davy, director of the Mont Souris Observatory. It is evident that through the recent studies of Professor Ferrel a decided advance has been made in our knowledge of this instrument.

#### MOUNT WHITNEY MILITARY RESERVATION.

This reservation was officially declared on October, 1883, but no special observations have been made there during the past year. The great advantages offered by this location make it probable that in another year it will be desirable to occupy this station for the determination of various questions in hygrometry, solar and terrestrial radiation.

#### TORNADO STUDIES.

The collection and study of data relative to tornadoes, was, in January, 1884, added to the duties of the study room, and Sergeant Finley (who has devoted himself to this branch of the service since 1878) was transferred to take charge of this subdivision. A full report of his connection with the work is submitted herewith (see paper C), from which it will be seen that up to June 30 he has secured 957 special tornado reporters, and has issued the necessary instructions. He has also published a series of tornado charts illustrating the special features of the groups of tornadoes that occurred on February 19, March 11, 25, April 1, 14, 27, 28, May 5, 18, 21, June 7, 8, July 4, 5, all of 1884. These have been widely recognized as throwing much light upon a subject in general but little understood. Records have been collected relative to several hundred tornadoes additional to the 600 tabulated in Professional Paper No. VII. In order to test the practical value of the knowledge thus obtained, daily tornado predictions were by your orders undertaken, and have continued uninterruptedly from March 10 to the present date. The country was divided into eighteen tornado districts, each averaging about 200 miles square, and for each of these predictions have been made, at first twice daily at 10 a. m. and 6 p. m. eight hours in advance, but now once daily at 10 a. m. for sixteen hours in advance, stating whether or not tornadoes are likely to occur.

These tornado predictions are, therefore, in many respects comparable with the predictions of high winds, made by hoisting cautionary signals. The absence of a signal means no high winds expected, and the sense of security enjoyed by the maritime community when no cautionary signal is displayed has for years been recognized as being of great value to the community.

It is anticipated that precisely similar advantages must result to the inland communities if we adopt a parallel system of signals or warnings as soon as the accuracy of these predictions equals that of the cautionary signals. Thus far the predictions have been considered as purely a matter of preliminary study and practice.

#### INDEX TO METEOROLOGY.

In order to avail ourselves of the numerous published investigations by meteorological students, attention has continued to be given to the formation of an index catalogue of meteorological literature; in March, 1884, this work was confided to Mr. C. J. Sawyer as bibliographer.

The catalogue of meteorological literature compiled for this office by Mr. G. J. Symons, of London, with the assistance of Professors André Poey and M. Leon Teisserenc de Bort, of Paris, has been received, and is being combined with the meteorological titles from the Royal Society catalogue of scientific papers and other sources.

Through the courtesy of Dr. Gustav Hellmann, of Berlin, this collection will be enriched by the incorporation of the titles in his recently published "Repertorium der Deutschen Meteorologie," while many other very valuable additions have been obtained through the co-operation of meteorologists in this country and abroad. The number of titles (40,000) fully warrants the expectation of an approximately com-

plete bibliography of meteorology, and the hearty co-operation of many meteorologists shows their high appreciation of the importance of the work.

#### INTERNATIONAL POLAR STATIONS.

The international agreement by virtue of which every civilized nation has contributed its share towards meteorological and magnetic observations in Arctic and Anti-Arctic regions has during the past year been brought to completion.

The observations at Point Barrow and Lady Franklin Bay, in charge of Lieutenants Ray and Greeley, respectively, were discontinued in August, 1883; the former party returned to Washington in October. In the preparation of this work for publication the study room has merely an advisory responsibility, and has been freely consulted. The meteorological observations made by the L. F. B. Relief Party of 1883 were prepared for publication under my supervision, and ordered printed as Signal Service Note No. XIV.

The observations made by Private Palmaerts on the L. F. B. Relief expedition of 1882 have been received; but as these were made with unverified instruments it appears unnecessary to publish them in full.

In response to an invitation from the International Polar Commission relative to the possibility of continuing these Polar stations for several years longer, it has been advised that we await first the publication and discussion of the observations that have accumulated during 1881-'82-'83.

#### THUNDER-STORM STUDIES.

Notwithstanding the importance of making a special study of thunder-storms, and although it had several times been urged upon your predecessor, it had not been recognized by this office as a special branch of its work until the spring of 1884, when at his own request Professor Hazen was by you authorized to begin the collection and study of thunder-storms data.

The details of this work are given in a short extract from his report (see Paper D), from which it will be seen that through the co-operation of the Postmaster-General several thousand voluntary observers have been secured, and the system of prompt report by postal card is in successful operation.

#### SCIENTIFIC PUBLICATIONS.

A number of publications have emanated from the study room during the past year, and have been published either with your permission in scientific journals or by your order as Signal Service papers. The following is a list of such publications:

No.	Title and reference.	Author.
1	On a method of filling barometer tubes. American Journal of Science, January, 1884.	F. Waldo.
2	Reply to Heath's criticism of Ferrel. L. E. & D. Philosophical Magazine, 1883.	F. Waldo.
3	Study of meteorology in the Higher Schools of Germany, Switzerland, and Austria. Signal Service Notes, No. VIII. (A translation of this Signal Service Note has been published in the "Meteorologische Zeitschrift," March-April, 1884.)	F. Waldo.
4	The Russian Meteorological Service. Science, February, 1, 1884.	F. Waldo.
5	How to save life from tornadoes. Burlington (Iowa) Chronicle, May, 1884.	J. P. Finley.
6	Tornado predictions. American Meteorological Journal, July, 1884.	J. P. Finley.
7	Progress in tornado investigation. Science, Cambridge, June 20, 1884.	J. P. Finley.
8	The character of 600 tornadoes. A revised edition of Professional Paper No. VII.	J. P. Finley.
9	Charts of relative storm frequency for a portion of the northern hemisphere. Professional Paper No. XIV.	J. P. Finley.
10	The special characteristics of tornadoes with practical directions for the protection of life and property. Signal Service Notes, No. XII.	J. P. Finley.
11	Signal Service tornado circulars 1-24. (These are confined mostly to instructions and forms for tornado observers, and preliminary charts of tornadoes.)	J. P. Finley.
12	The effect of wind currents on rainfall. Signal Service Notes, No. XVI.	G. E. Curtis.
13	The relation between northerly and magnetic disturbances at Havana, Cuba. Signal Service Notes, No. XIII.	G. E. Curtis.
14	The red skies. Science, January 11, 1884.	W. Upton.
15	Numerous contributions on the progress of meteorology. Reviews of meteorological publications, &c.	W. Upton.
16	Notes on meteorological progress in 1882 and 1883. Smithsonian Report for 1883.	C. Abbe.
17	The prediction of the weather. (Chapter IV of "How to use weather maps.") Signal Service Circular.	C. Abbe.
18	Bibliography of meteorology for 1883. Smithsonian Report, 1883.	C. J. Sawyer.
19	Thermometer exposure. American Journal of Science, May, 1884.	H. A. Hassen.
20	The dry and wet bulb thermometer fronde. American Meteorological Journal, June, 1884.	H. A. Hassen.
21	The motion of waves of cold in the United States. Science, February 8, 1884.	H. A. Hassen.
22	The origin of a tornado. Washington Daily Post, March 30, 1884.	H. A. Hassen.
23	The sun-glows. American Journal of Science, March, 1884.	H. A. Hassen.

## INSTRUCTION IN METEOROLOGY.

The study room has continued to be as heretofore somewhat occupied in the matter of instruction in meteorology. Not only has nearly the whole time of Professor Waldo been given to the school at Fort Myer during the past five or six months, but in several ways efforts have been made to stimulate greater attention to this subject.

(a) *Lectures at Fort Myer.*—Courses of ten lectures were given in the fall of 1883 to the class then under instruction at Fort Myer by myself and Professors Upton and Hazen, and shorter courses by Professors Waldo and Russell. These courses covered substantially the same ground as those detailed in my previous reports, except some changes in the course by Professor Upton, for the details of which see the accompanying inclosure (Paper E.)

(b) *Instruction of officers.*—In December, 1883, two officers, Lieutenants Woodruff and Glassford, were ordered to pursue under me the course of instruction prescribed as preliminary to duty for indication officers. This course was somewhat modified with your permission, and was completed on the 28th of June.

(c) *General system of instruction for the service.*—The experience had in instruction was embodied in a report from me dated May 1, recommending a general system of instruction, examination, and promotion for the whole service.

This elaborate report is adapted to the present condition of neglect of meteorology in schools and colleges. No such extensive instruction would be necessary if we could directly secure a sufficient number of educated meteorologists as observers, officers, and experts.

(d) *Course of instruction for colleges.*—It is very desirable that the colleges should pay more attention to meteorology, and something has been done to stimulate activity in this matter, as follows:

(1) A course of study was suggested by me for use at Brown University. (See Paper F.)

(2) Professor Waldo's report on the study of meteorology in Germany has been widely circulated in this country as Signal Service Note No. VIII.

(3) A short course of lectures was given to the Washington Normal School, and with your permission, others have been promised to Johns Hopkins University and Columbian University.

(e) *Text books.*—An explanation of the sources of error and of the ordinary formulæ for correcting meteorological instruments, such as the barometer, thermometer, anemometer, &c., having been needed in the instruction of men and officers, I have by your order undertaken to make such compilation which will be mainly an enlargement of my course of lectures at Fort Myer. Such information is easily obtained in French and German, but is not available in English.

The "*Popular Essays*" by Professor Ferrel, whose publication was anticipated in my last annual report have appeared as Professional Paper No. XII, and have been used to great advantage in the course of instruction for the indications room, which course needs revision annually in order to keep up with the progress of the science.

(f) *Special course of instruction under experts.*—The necessity of securing proper instruction for the able enlisted men who are selected for special observations in difficult departments in meteorology has, as before explained, led to the instruction of Privates Morrell, McAdie, and McRae in atmospheric electricity; an equally valuable but to us novel and difficult class of observations relates to the absorption of sunlight, the polarization of the light of the sky, the spectroscopic analysis of the colors of the sky and clouds; as these observations will probably give us important knowledge of the moisture and other atmospheric conditions I have recommended that Sergeant O. B. Cole, of the Boston station in addition to his other duties report to Prof. E. C. Pickering, of Cambridge, for instruction and practice in this work.

*General notes and correspondence.*—With your permission the members of the study room have continued, but only to a very limited extent, to publish in scientific and popular journals brief abstracts or notices of new books, inventions, discoveries, &c.; thus utilizing for the benefit of the general public the extensive reading that is necessarily kept up at this office.

In the course of the scientific correspondence of the office there has been frequent occasion to prepare letters embodying information which cannot but contribute to the instruction of the community.

In these replies the following subjects among others have been treated of:

Solar and terrestrial radiation.

The variations of temperature and rainfall on mountain sides.

Periodicity of rainy and dry seasons.

The influence of the moon and planets on the weather.

Frost phenomena on sandy ground.

Cloud studies.

Notes on the history of Meteorology in the United States.

The red sunsets of 1883, 1884.

## MISCELLANEOUS.

(a) *Civil Service examination.*—On account of the necessity of filling the vacancy caused by the resignation of Professor Upton much time has been consumed in the effort to select a successor in accordance with the rules of the Civil Service Commission. By special act of the President and Secretary of War the competition was opened to the enlisted men of the corps.

In order to indicate the standard which was sought to be established by the examination, I append two lists of questions, the first (Paper G) that which was adopted for a non-competitive examination, and the second (Paper H) that adopted for a final competitive examination. From this latter paper it will be seen that it was the intention of the special board of examiners to determine by the first portion of the examination a list of such candidates as possessed sufficient knowledge to make them eligible, and by means of the second portion of the examination to select the one whose experience and ability in original study made him the most desirable.

It would seem desirable that in case of any future similar examination this second part be made more prominent.

(b) *Distribution of publications.*—The question of the proper edition and distribution of the meteorological publications of this office has frequently been referred to the study room, and considerable labor has been given to the formation of a list of regular recipients as distinguished from the miscellaneous and occasional requests.

(c) *The sunset phenomena of 1883.*—The remarkable red sunset skies of the autumn and winter of 1883 gave occasion to several brief studies, the results of which were embodied in short papers by Professors Upton and Hazen, as previously enumerated in the section on publications. The lack of systematic and satisfactory methods of observations of sky colors, and absorption of sunlight, polarization, &c., was sadly felt when this beautiful phenomenon surprised not only us but meteorologists throughout the world, and several have expressed the hope that another such experience will find us prepared with instruments and experienced observers.

The extensive areas of smoky haze from forest fires offer us in this country annual opportunities of investigating analogous optical phenomena. I have, therefore, after correspondence and consultation with Professor Pickering of Harvard College Observatory recommended that a competent sergeant be ordered to report to him for instruction in the proper optical observations. As every indication pointed toward the eruption of Krakatoa as the origin of this special phenomenon, some attention has been given to the collection of volcanic dust, two specimens of which have been submitted, one collected near Krakatoa and presented by Professor Upton, the second gathered by Sergeant Applegate at Unalashka, and emanating from a volcano in its neighborhood. As an intimate connection between the matter erupted from all the volcanoes in the Pacific Basin had been plausibly made out, both of the above samples were submitted to Mr. J. S. Diller, assistant to the director of the United States Geological Survey, and his report thereon has been published in "Nature." It is recommended that observers at favorable stations be ordered to secure every vestige of atmospheric dust that may be brought down by rain or snow. This can easily be accomplished by furnishing rain-gauges of the pattern adopted by Mr. Fitzgerald, of the Chestnut Hill Water Works, Boston, Mass.

(d) *Self-recording apparatus.*—As very many important questions can only be answered by reference to reliable self-registers on which the minutest changes are recorded, it is considered very desirable that at least half a dozen stations should be supplied with the best forms of self-registers for pressure, temperature, wind force (not velocity only, but also pressure in pounds per square foot), wind direction, rainfall, sunshine. In these registers special care should be taken that the time scales be large enough to show fractions of minutes, or capable of such enlargement subsequently, and be mutually consistent to within a second.

(e) *Translations.*—In order to disseminate in this country knowledge on subjects that may have special interest, a little time has been occasionally devoted to the preparation of translations of interesting foreign papers on meteorology. Two such translations have been prepared during the year; namely, Pernter "On the formula for the Psychrometer," and Woelkoff "On the climatic conditions of past and present glacial phenomena."

(f) *Scientific and military ballooning.*—As the use of the balloon for military purposes has received much attention and is highly appreciated in Europe, it is probable that this also may at some time become a duty of the Signal Office.

It is, therefore, proper to call your attention to the fact that several important problems in meteorology can be studied only with the help of balloons and ascensions, and it is desirable that the Signal Service should not neglect this method of investigation. All ascensions hitherto made in this country have been business ventures, in which all scientific interests have been subservient to financial considerations.

I recommend that arrangements be made with Prof. S. A. King, of Philadelphia, looking to one or more ascensions in which the object shall be to attain the greatest

possible height near the center of an area of high barometer and again near the center of an area of low barometer; also at night time during an aurora and again at midday during a season of frequent thunder-storms.

The special observations to be made on these occasions will of course vary with the time and nature of the ascension. We frequently find ourselves unable, from the weather maps, to find what has become of the mass of air that blows from both sides towards a long barometric trough. It would seem that this question can best be studied by means of very small balloons from 1 to 3 feet in diameter, each bearing a numbered tag. By setting free many such balloons at a number of stations, by observing their courses and subsequent landing places, it is believed that a considerable addition to our knowledge will be made. Similar small but captive balloons have been successfully used for obtaining maximum and minimum temperatures at moderate heights in the atmosphere.

The ascensions that are generally made on the 4th of July at numerous places in this country were studied by me in 1871-'72-'73, in connection with the daily weather maps of those dates, and helped to elucidate the atmospheric conditions on those days, and I renew my recommendation first made at that time as to the systematic use of small free balloons.

(g) *International Meteorological Congress*.—In conclusion, I beg to call attention to the importance of a personal inspection by yourself of the European weather bureaus on the occasion of the forthcoming International Congress.

I have the honor to remain, very respectfully yours,

CLEVELAND ABBE,  
Professor and Assistant.

[Inclosures.]

PAPER A.—Monthly constants.

PAPER B.—Locations of Signal Service barometers.

PAPER C.—Sketch of progress in tornado study.

PAPER D.—Progress in study of thunder storms.

PAPER E.—Lectures delivered by Professor Upton.

PAPER F.—Sketch of a course of study in meteorology.

PAPER G.—Questions for non-competitive examination.

PAPER H.—Questions for competitive examination.

## PAPER A.

### MONTHLY CONSTANTS FOR REDUCTION TO SEA LEVEL.

GENERAL ORDERS }  
No. 5. }

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington, January 10, 1884.

The following revised list of monthly constants for the reduction of barometric observations is published for the information of all concerned. The column headed "Altitude" contains the elevation above sea level of the barometers at the several stations, as adopted by this office. The letter B denotes that the altitude has been obtained from barometric readings. The values given in this column will be used on all forms instead of values heretofore in use.

*Monthly constants for the reduction to sea level of barometric observations made at Signal Service stations.*

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y. ....	75	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09
Alexander, Fort, Alaska ....	38	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Alpena, Mich. ....	609	0.71	0.71	0.70	0.69	0.69	0.65	0.64	0.64	0.65	0.67	0.70	0.71
Apache, Fort, Ariz. ....	5,050 B	5.12	5.10	5.02	4.92	4.82	4.75	4.74	4.72	4.80	4.90	5.10	5.08
Astoria, Fort, Mont. ....	2,710 B	2.04	2.04	2.01	2.00	2.84	2.79	2.73	2.75	2.85	2.92	2.98	3.03
Atlanta, Ga. ....	1,129	1.23	1.22	1.21	1.19	1.17	1.15	1.15	1.15	1.17	1.19	1.22	1.23
Atlantic City, N. J. ....	13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Augusta, Ga. ....	183	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20
Baltimore, Md. ....	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Barnegat City, N. J. ....	23	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

*Monthly constants for the reduction to sea level of barometric observations, &c.—Continued.*

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Behring's Island, Behring Sea.	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Bennett, Fort, Dak.	1,510 B	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.54	1.59	1.62	1.69	1.76
Benton, Fort, Mont.	2,694 B	2.98	3.00	2.98	2.86	2.79	2.77	2.71	2.79	2.84	2.91	2.96	3.00
Bismarck, Dak.	1,694	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.84	1.93	2.02
Block Island, R. I.	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Boise City, Idaho	2,750 B	2.93	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.98
Boston, Mass.	142	0.17	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.16
Brownsville, Tex.	59	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Buffalo, N. Y.	690	0.79	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.77	0.79
Buford, Fort, Dak.	1,930 B	2.23	2.21	2.16	2.10	2.00	1.99	1.96	1.98	2.02	2.10	2.16	2.27
Cairo, Ill.	377	0.42	0.42	0.42	0.41	0.40	0.39	0.39	0.39	0.40	0.40	0.42	0.42
Canby, Fort, Wash.	179	0.20	0.20	0.20	0.20	0.20	0.19	0.10	0.19	0.20	0.20	0.20	0.20
Cape Henry, Va.	16	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cape May, N. J.	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cape Mendocino, Cal.	637	0.70	0.70	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.69	0.70	0.70
Cedar Keys, Fla.	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charleston, S. C.	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Charlotte, N. C.	808	0.89	0.89	0.88	0.86	0.84	0.83	0.83	0.83	0.84	0.86	0.88	0.89
Chatanooga, Tenn.	783	0.86	0.86	0.85	0.83	0.81	0.81	0.80	0.80	0.81	0.83	0.85	0.86
Cheyenne, Wyo.	6,105	6.27	6.27	6.20	6.02	5.89	5.76	5.71	5.72	5.88	6.04	6.23	6.38
Chicago, Ill.	661	0.75	0.75	0.74	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Chincoteague, Va.	18	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cincinnati, Ohio	620	0.69	0.69	0.69	0.67	0.65	0.65	0.64	0.64	0.65	0.66	0.69	0.70
Cleveland, Ohio	690	0.78	0.79	0.78	0.76	0.73	0.73	0.72	0.72	0.72	0.74	0.77	0.79
Coleman City, Tex.	1,709	1.88	1.88	1.85	1.83	1.79	1.75	1.76	1.74	1.79	1.82	1.89	1.90
Columbus, Ohio	805	0.90	0.90	0.89	0.87	0.84	0.84	0.83	0.83	0.84	0.86	0.89	0.91
Concho, Fort, Tex.	1,900 B	2.02	2.02	1.97	1.94	1.90	1.87	1.88	1.86	1.90	1.95	2.01	2.02
Custer, Fort, Mont.	3,040 B	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa	915	0.71	0.70	0.69	0.67	0.64	0.64	0.63	0.63	0.65	0.66	0.69	0.71
Davis, Fort, Tex.	4,940 B	4.98	4.96	4.88	4.79	4.72	4.61	4.64	4.65	4.70	4.85	4.90	4.94
Dayton, Wash. T.	1,667 B	1.81	1.82	1.83	1.76	1.76	1.75	1.72	1.72	1.75	1.79	1.79	1.84
Deerwood, Dak.	4,600 B	4.95	4.92	4.84	4.69	4.52	4.44	4.43	4.44	4.56	4.68	4.84	4.99
Delaware Breakwater, Del.	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Denver, Colo.	5,294	5.52	5.52	5.44	5.27	5.16	5.04	5.01	5.02	5.11	5.26	5.50	5.52
Des Moines, Iowa	849	0.97	0.97	0.96	0.93	0.89	0.88	0.88	0.88	0.89	0.92	0.95	0.98
Detroit, Mich.	661	0.76	0.75	0.75	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Dodge City, Kans.	2,517	2.75	2.74	2.73	2.64	2.55	2.51	2.50	2.48	2.55	2.63	2.74	2.80
Dubuque, Iowa.	665	0.77	0.76	0.75	0.73	0.70	0.69	0.69	0.69	0.70	0.72	0.75	0.77
Duluth, Minn.	687	0.81	0.81	0.79	0.77	0.75	0.73	0.72	0.72	0.74	0.76	0.79	0.82
Eastport, Me.	61	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07
Elliott, Fort, Tex.	2,650 B	2.93	2.90	2.83	2.78	2.70	2.67	2.64	2.64	2.69	2.79	2.83	2.86
El Paso, Tex.	3,764 B	3.88	3.88	3.80	3.74	3.64	3.59	3.60	3.60	3.65	3.74	3.85	3.88
Erie, Pa.	681	0.77	0.77	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.77
Escanaba, Mich.	612	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.67	0.70	0.72
Fort Smith, Ark.	449	0.50	0.50	0.49	0.48	0.47	0.46	0.46	0.46	0.47	0.48	0.49	0.50
Galveston, Tex.	40	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Grand Haven, Mich.	620	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71
Grant, Fort, Ariz.	4,860 B	4.90	4.86	4.83	4.73	4.61	4.54	4.57	4.57	4.60	4.70	4.84	4.88
Hatteras, N. C.	12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Helena, Mont.	4,100 B	4.43	4.40	4.37	4.26	4.17	4.12	4.06	4.09	4.17	4.30	4.38	4.38
Huron, Dak.	1,305	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind.	753	0.84	0.85	0.84	0.82	0.79	0.78	0.77	0.77	0.78	0.80	0.84	0.85
Indianola, Tex.	26	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Jacksonville, Fla.	43	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Keokuk, Iowa	618	0.70	0.70	0.69	0.67	0.65	0.64	0.63	0.63	0.63	0.67	0.69	0.71
Key West, Fla.	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Kitty Hawk, N. C.	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Knoxville, Tenn.	960	1.08	1.08	1.06	1.04	1.02	1.01	1.00	1.01	1.02	1.04	1.07	1.08
La Crosse, Wis.	725	0.84	0.84	0.82	0.80	0.76	0.76	0.75	0.75	0.77	0.79	0.82	0.85
Leavenworth, Kans.	442	0.96	0.95	0.94	0.91	0.88	0.87	0.86	0.86	0.88	0.90	0.94	0.94
Lewiston, Idaho	780 B	0.67	0.67	0.66	0.65	0.64	0.62	0.61	0.61	0.63	0.65	0.67	0.68
Little Rock, Ark.	298	0.33	0.33	0.33	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.33	0.33
Los Angeles, Cal.	371	0.40	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.40	0.40	0.40
Louisville, Ky.	630	0.59	0.59	0.59	0.57	0.55	0.55	0.55	0.55	0.55	0.57	0.59	0.60
Lynchburg, Va.	652	0.72	0.72	0.72	0.71	0.68	0.67	0.67	0.67	0.68	0.69	0.72	0.73

## REPORT OF THE CHIEF SIGNAL OFFICER.

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Monthly constants for the reduction to sea level of barometric observations, &amp;c.—Continued.

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mackinaw City, Mich.	605	0.70	0.70	0.70	0.68	0.65	0.64	0.64	0.64	0.65	0.67	0.69	0.70
Macon, Fort, N. C.	11	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Maginnia, Fort, Mont.	4,340 B	4.55	4.54	4.52	4.40	4.33	4.28	4.24	4.27	4.34	4.44	4.51	4.54
Marquette, Mich.	673	0.78	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.72	0.74	0.77	0.78
Memphis, Tenn.	281	0.30	0.35	0.35	0.34	0.33	0.33	0.33	0.33	0.34	0.34	0.35	0.36
Milwaukee, Wis.	607	0.80	0.80	0.70	0.77	0.74	0.74	0.73	0.73	0.74	0.76	0.79	0.81
Mobile, Ala.	41	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Montgomery, Ala.	210	0.24	0.24	0.24	0.23	0.23	0.22	0.23	0.22	0.23	0.24	0.24	0.24
Mount, Minn.	923	1.11	1.10	1.08	1.03	0.98	0.97	0.96	0.97	0.99	1.02	1.06	1.11
Mount Washington, N. H.	6,279	6.63	6.62	6.52	6.11	6.18	6.12	6.07	6.06	6.15	6.34	6.56	6.63
Mt. Fort, Va.	267	0.30	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.29	0.30	0.30
Nashville, Tenn.	549	0.61	0.61	0.60	0.58	0.57	0.56	0.56	0.56	0.57	0.58	0.60	0.61
New Haven, Conn.	107	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.12	0.12	0.12
New London, Conn.	47	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
New Orleans, La.	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
New York City	164	0.19	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.18	0.18	0.19
Norfolk, Va.	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
North Platte, Nebr.	2,841	3.12	3.10	3.06	2.96	2.87	2.80	2.80	2.88	2.88	2.96	3.08	3.16
Olympia, Wash T.	36	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Omaha, Nebr.	1,113	1.27	1.27	1.25	1.21	1.16	1.14	1.13	1.14	1.17	1.20	1.24	1.29
Orangetown, N. Y.	304	0.35	0.35	0.34	0.34	0.33	0.32	0.32	0.32	0.32	0.33	0.34	0.35
Pakistan, Tex.	533	0.58	0.58	0.57	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.57	0.58
Ponca, La. Fla.	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Philadelphia, Pa.	92	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11
Pike's Peak, Colo.	14,134	12.70	12.72	12.59	12.26	12.06	11.82	11.78	11.79	11.98	12.28	12.66	12.66
Pittsburg, Pa.	766	0.85	0.86	0.85	0.83	0.80	0.79	0.79	0.79	0.79	0.82	0.85	0.86
Poplar River, Mont.	2,030 B	2.35	2.35	2.30	2.20	2.12	2.10	2.08	2.08	2.15	2.22	2.29	2.36
Port Huron, Mich.	633	0.73	0.73	0.72	0.70	0.68	0.67	0.66	0.66	0.67	0.68	0.72	0.73
Portland, Me.	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Portland, Oreg.	67	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Prescott, Ariz.	5,340 B	5.28	5.26	5.24	5.22	5.19	5.02	4.99	4.98	5.10	5.16	5.34	5.37
Provincetown, Mass.	26	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Red Bluff, Cal.	332	0.37	0.37	0.37	0.36	0.35	0.35	0.34	0.35	0.35	0.36	0.37	0.37
Rio Grande City, Tex.	230 B	0.25	0.25	0.24	0.24	0.24	0.23	0.23	0.24	0.24	0.24	0.25	0.25
Rochester, N. Y.	621	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.65	0.67	0.70	0.71
Roseburg, Oreg.	511	0.57	0.57	0.56	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.57	0.57
Sacramento, Cal.	65	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.08	0.08
Saint Louis, Mo.	583	0.66	0.66	0.65	0.63	0.61	0.60	0.60	0.60	0.61	0.62	0.65	0.66
Saint Michael's, Fort, Alaska	30	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
Saint Paul, Minn.	601	0.94	0.93	0.91	0.88	0.84	0.84	0.83	0.83	0.83	0.87	0.91	0.95
Saint Vincent, Minn.	904	0.98	0.97	0.94	0.91	0.86	0.85	0.84	0.85	0.87	0.90	0.93	0.99
Salt Lake City, Utah.	4,348 B	4.57	4.56	4.52	4.37	4.32	4.22	4.18	4.19	4.25	4.40	4.57	4.54
San Diego, Cal.	67	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Sandusky, Ohio.	639	0.72	0.72	0.70	0.70	0.67	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Sandy Hook, N. J.	28	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Sanford, Fla.	50 B	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
San Francisco, Cal.	60	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Savannah, Ga.	87	0.10	0.09	0.09	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
Shaw, Fort, Mont.	3,560 B	3.88	3.85	3.80	3.67	3.60	3.57	3.51	3.53	3.61	3.70	3.82	3.88
Shreveport, La.	227	0.25	0.25	0.25	0.24	0.24	0.23	0.23	0.23	0.24	0.24	0.25	0.25
Sill, Fort, Ind. T.	1,200 B	1.33	1.31	1.29	1.24	1.22	1.20	1.20	1.18	1.22	1.26	1.31	1.33
Sika, Alaska	63	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07
Smithville, N. C.	34	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Spokane Falls, Wash T.	1,906	2.14	2.13	2.13	2.06	2.05	2.04	1.98	2.00	2.04	2.08	2.08	2.13
Springfield, Ill.	644	0.73	0.73	0.72	0.70	0.67	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Stockton, Fort, Tex.	3,010 B	3.14	3.13	3.08	3.03	3.01	2.92	2.94	2.94	2.96	3.03	3.12	3.14
Tatous Island, Wash T.	86	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10
Thomas, Fort, Ariz.	2,710 B	2.63	2.62	2.78	2.73	2.67	2.63	2.59	2.62	2.61	2.71	2.84	2.82
Toledo, Ohio.	651	0.74	0.74	0.73	0.71	0.68	0.68	0.67	0.67	0.68	0.70	0.73	0.74
Unalakleet, Alaska	13	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Vicksburg, Miss.	244	0.27	0.27	0.26	0.26	0.25	0.25	0.24	0.24	0.25	0.26	0.27	0.27
Washington City.	106	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12
West Lee Animas, Colo.	3,899	4.13	4.12	4.07	3.95	3.85	3.77	3.75	3.74	3.82	3.93	4.11	4.15
Wilmington, N. C.	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Yankton, Dak.	1,228	1.42	1.42	1.39	1.34	1.28	1.28	1.27	1.27	1.29	1.33	1.38	1.43
Yuma, Ariz.	141	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.15



## PAPER B.

*Locations of Signal Service barometers on January 1, 1883, and all subsequent changes up to June 30, 1884.*

Stations.	Latitude.	Longitude.	Elevation January 1, 1883.	Remarks.
	° ' "	° ' "	Feet.	
Albany, N. Y.	42 39	73 45	75	
Alexander, Fort, Alaska	53 54	153 14	.....	
Alpena, Mich.	45 5	83 30	609	
Apache, Fort, Ariz.	33 48	109 57	5,050 B	
Assinaboine, Fort, Mont.	48 32	109 42	2,710 B	Moved March 12, 1884. H = 2,720.
Atlanta, Ga.	33 45	84 23	1,131	Moved January 6, 1883. H = 1,129.
Atlantic City, N. J.	39 22	74 25	13	
Augusta, Ga.	33 28	81 54	183	
Baltimore, Md.	39 18	76 37	45	
Barnegat City, N. J.	39 46	74 6	22	
Behring's Island, Behring Sea	55 12	165 55 E	20	
Bennett, Fort, Dak.	44 43	100 39	1,510 B	
Benton, Fort, Mont.	47 50	110 40	2,694 B	Changed April 1, 1884. H = 2,681.
Billings, Mont.	45 49	108 30	3,122	
Bismarck, Dak.	46 47	100 38	1,694	
Block Island, R. I.	41 10	71 36	27	
Boise City, Idaho	43 37	116 8	2,750 B	
Boston, Mass.	42 21	71 4	142	
Brownsville, Tex.	25 58	97 26	59	New level value. Moved January 31, 1884. H = 57.
Buffalo, N. Y.	42 53	78 53	696	Moved November 1, 1883. H = 690.
Buford, Fort, Dak.	48 0	103 56	1,930 B	
Burlington, Vt.	44 29	73 13	268	Station discontinued June 15, 1883.
Cairo, Ill.	37 0	89 10	377	
Canby, Fort, Wash. T.	46 16	124 4	.....	Established September 1, 1883. H = 179.
Cape Henry, Va.	36 56	76 0	16	
Cape May, N. J.	38 56	74 58	27	
Cape Mendocino, Cal.	40 26	124 24	637	
Cedar Keys, Fla.	29 8	83 2	22	
Champaign, Ill.	40 8	88 14	767	Discontinued June 15, 1883.
Charleston, S. C.	32 47	79 56	52	
Charlotte, N. C.	35 13	80 51	808	
Chattanooga, Tenn.	35 4	85 15	783	
Cheyenne, Wyo.	41 8	104 48	6,089	Moved December 1, 1883. H = 6,105.
Chicago, Ill.	41 52	87 38	661	
Chimo, Fort, Ungava Bay, Labrador.	59 0	68 0	.....	
Chincoteague, Va.	37 55	75 23	18	Moved June 1, 1884. H = 8.
Cincinnati, Ohio	39 6	84 30	620	
Cleveland, Ohio.	41 30	81 42	690	
Columbus, Ohio.	39 58	83 0	805	
Concho, Fort, Tex.	31 25	100 24	1,900 B	
Custer, Fort, Mont.	45 42	107 34	3,040 B	Made 8d class, January 1, 1883. 1st class June 8, 1883.
Davenport, Iowa	41 30	90 38	615	
Davis, Fort, Tex.	30 38	103 56	4,940 B	Moved March 3, 1884. H = 4,925 B.
Dayton, Wash. T.	46 19	117 56	1,667 B	Moved August 1, 1883. H = 1,683 B.
Deadwood, Dak.	44 23	103 43	4,600 B	
Delaware Breakwater, Del.	38 48	75 10	20	
Denison, Tex.	33 48	96 32	767	Discontinued June 15, 1883.
Denver, Colo.	39 45	105 0	5,294	
Des Moines, Iowa	41 35	93 37	849	
Detroit, Mich.	42 20	83 3	661	Barometer moved 7 inches. H = 662.
Dodge City, Kans.	37 45	100 0	2,512	Moved December 15, 1883. H = 2,517.
Dubuque, Iowa.	42 30	90 44	965	
Duluth, Minn.	46 48	92 6	687	
Eagle Pass, Tex.	28 44	100 29	780 B	Discontinued June 15, 1883.
Eagle Rock, Idaho	43 32	111 55	4,650	Moved May 26, 1883, H = 4,654. Discontinued June 15, 1883.
Eastport, Me.	44 54	66 59	61	
Elliott, Fort, Tex.	35 30	100 21	2,650 B	
El Paso, Tex.	31 47	106 30	3,764 B	
Erie, Pa.	42 7	80 5	681	
Escanaba, Mich.	45 48	87 5	612	Barometer moved March 1, 1884, H = 613.
Fort Smith, Ark.	35 22	94 24	451	
Galveston, Tex.	29 18	94 47	48	Moved March 15, 1883, H = 40.
Grand Haven, Mich.	43 5	86 18	620	
Grant, Fort, Ariz.	32 39	109 57	4,890 B	Moved February 21, 1884, H = 4,886 B.
Hatteras, N. C.	35 15	75 40	19	Moved October 1, 1883, H = 12.
Helena, Mont.	46 34	112 4	4,100 B	Moved January 1, 1884, H = 4,044.
Huron, Dak.	44 21	98 9	1,805	
Indianapolis, Ind.	39 48	86 10	783	

Locations of Signal Service barometers on January 1, 1883, &amp;c.—Continued.

Stations.	Latitude.	Longi- tude.	Elevation January 1, 1881.	Remarks.
	° ' "	° ' "	Feet.	
Indianola, Tex.	28 32	96 31	26	
Jacksonville, Fla.	30 20	81 39	43	
Kearney, Fort, Mont.	46 22	105 56	2,372	Discontinued June 15, 1883.
Kodiak, Iowa	40 22	91 26	618	
Key West, Fla.	24 24	81 49	20	
Kitty Hawk, N. C.	36 0	75 42	22	
Knoxville, Tenn.	35 56	88 58	980	
La Crosse, Wis.	43 49	91 15	725	
Lady Franklin Bay, Grinnell Land.	81 20	64 58		
Leavenworth, Kans.	39 19	94 57	842	
Lewiston, Idaho	46 8	117 5	780 B	
Little Rock, Ark.	34 45	92 6	298	Barometer raised April 1, 1884, H=298.
Los Angeles, Cal.	34 3	118 15	371	
Louisville, Ky.	38 15	85 45	530	
Lynchburg, Va.	37 25	79 9	652	
McKavitt, Fort, Tex.	30 48	100 7	2,240 B	Discontinued April 31, 1883.
Mackinaw City, Mich.	45 47	84 29	605	
Macon, Fort, N. C.	34 42	76 40	11	
Madison, Wis.	43 5	89 24	949	Discontinued April 1, 1883.
Maginnis, Fort, Mont.	47 12	100 10	4,340 B	
Marquette, Mich.	46 34	87 24	678	
Memphis, Tenn.	35 9	90 8	321	
Milwaukee, Wis.	43 2	87 54	697	
Mobile, Ala.	30 41	88 2	41	Moved June 1, 1884. H=35.
Montgomery, Ala.	32 23	86 18	219	
Moorehead, Minn.	46 52	96 44	922	
Mount Pleasant, W. Va.	39 40	79 50	963	Discontinued April 1, 1883.
Mount Washington, N. H.	44 16	71 18	6,279	
Nashville, Tenn.	36 10	86 47	549	
New Haven, Conn.	41 18	72 56	107	
New London, Conn.	41 21	72 5	47	
New Orleans, La.	29 58	90 4	59	
Newport, R. I.	41 29	71 19	44	Discontinued April 1, 1883.
New York City.	40 43	74 0	164	
Norfolk, Va.	36 51	76 17	30	
North Platte, Nebr.	41 8	100 45	2,841	
Olympia, Wash. T.	47 3	122 53	36	
Omaha, Nebr.	41 16	95 56	1,118	
Oglasnie, Point Barrow, Alaska.	71 16	156 40	17	
Orwego, N. Y.	43 29	76 35	304	
Palestine, Tex.	31 45	95 40	533	
Panama, Fla.	30 25	87 13	30	
Philadelphia, Pa.	39 57	75 9	92	Moved April 1, 1884. H=117.
Pike's Peak, Colo.	38 50	105 2	14,134	
Pischa, Nev.	37 50	114 26	6,110 B	Discontinued June 15, 1883.
Pittsburg, Pa.	40 32	80 2	766	
Poplar River, Mont.	48 8	105 10	2,030 B	
Port Erie, La.	29 9	89 15	7	Discontinued April 1, 1883.
Port Huron, Mich.	43 0	82 26	633	
Portland, Me.	43 39	70 15	45	
Portland, Oreg.	45 32	122 43	67	
Prescott, Ariz.	34 33	112 28	5,340 B	Moved March 19, 1884. H=5,340 B.
Provincetown, Mass.	42 3	70 11	26	
Punta Rasa, Fla.	26 29	82 1	13	Moved May 9, 1883. H=14. Discon- tinued June 15, 1883.
Red Bluff, Cal.	40 10	122 15	332	
Rio Grande City, Tex.	26 23	98 48	230 B	Discontinued January 1, 1883. Re-es- tablished June 8, 1883.
Rochester, N. Y.	43 8	77 42	621	Discontinued June 15, 1883. Re-es- tablished October 10, 1883.
Roseburg, Oreg.	43 13	123 20	511	
Sacramento, Cal.	38 35	121 30	65	Moved February 1, 1884. H=64.
Saint Louis, Mo.	38 38	90 12	568	Moved September 15, 1883. H=563.
Saint Michael's, Fort, Alaska.	63 28	161 48	30	
Saint Paul, Minn.	44 58	93 8	311	Moved April 16, 1883. H=301.
Saint Vincent, Minn.	48 56	97 14	304	
Salt Lake City, Utah	40 46	111 54	4,348	
San Antonio, Tex.	29 25	98 25	673	Discontinued June 15, 1883.
San Diego, Cal.	32 43	117 10	67	
Sandusky, Ohio	41 25	82 40	630	
Sandy Hook, N. J.	40 28	74 0	28	
Sanford, Fla.	28 48	81 23	50 B	
San Francisco, Cal.	37 48	122 26	60	
Santa Fe, N. Mex.	35 41	105 57	7,106	Discontinued June 15, 1883.
Savannah, Ga.	32 5	81 5	87	
Shaw, Fort, Mont.	47 31	111 48	3,550 B	
Shreveport, La.	32 30	92 40	227	

*Locations of Signal Service barometers on January 1, 1883, &c.—Continued.*

Stations.	Latitude.	Longitude.	Elevation January 1, 1883.	Remarks.
	° /	° /	Feet.	
Sil, Fort, Ind. T. ....	34 40	98 23	1, 200 B	
Sitka, Alaska .....	57 3	135 19	63	
Smithville, N. C. ....	33 55	78 1	34	
Spokane Falls, Wash. T. ....	47 40	117 25	1, 906	
Springfield, Ill. ....	39 48	89 89	644	
Springfield, Mo. ....	37 12	93 18	1, 351	Discontinued June 15, 1883.
Starkville, Miss. ....	33 35	88 49	455	Discontinued June 15, 1883.
Stevenson, Fort, Dak. ....	47 35	101 28	1, 750 B	Discontinued May 27, 1883.
Stockton, Fort, Tex. ....	30 53	102 53	3, 010 B	
Tatoosh Island, Wash. ....	48 23	124 44		Established October 1, 1883. H = 86.
Thomas, Camp, Ariz. ....	33 4	110 2	2, 710 B	
Toledo, Ohio .....	41 40	83 34	651	
Totten, Fort, Dak. ....	47 57	98 57		Established May, 1884. H = 1,500.
Umatilla, Oreg. ....	45 55	119 20	340 B	Discontinued April 1, 1883.
Unalaksha, Alaska .....	53 53	160 32	13	
Vicksburg, Miss. ....	32 22	90 53	244	
Visalia, Cal. ....	36 20	119 17	848	Discontinued June 15, 1883.
Washakie, Fort, Wyo. ....	43 1	108 54	5, 580 B	Discontinued June 15, 1883.
Washington City .....	38 54	77 8	106	
West Las Animas, Colo. ....	38 4	103 12	3, 905	Changed March 1, 1883. H = 3, 899.
Williamsport, Pa. ....	41 15	77 8	561	Discontinued June 15, 1883.
Wilmington, N. C. ....	34 14	77 57	52	
Yankton, Dak. ....	42 54	97 28	1, 228	
Yuma, Ariz. ....	32 45	114 36	141	

## PAPER C.

### SKETCH OF PROGRESS IN TORNADO STUDY.

Previous to 1882 the study of tornadoes was principally confined to the occasional investigation of one that was unusually destructive. During that year Sergeant Finley's Professional Paper No. VII was published, which classified a large list of tornadoes embracing a period of nearly 90 years and comprising a record of over 600 storms and stations.

Besides a brief summary of results deduced from a study of the tables, this paper also presented suggestions concerning the plan to be pursued in conducting the investigation of any tornado.

This work, together with that accomplished by the investigations of 1879 (see S. S. Professional Paper No. IV), led to the belief that a permanent system for the observation and report of tornadoes should be established. This system was to embrace not only what might be attained in the investigation of a single tornado, but to afford means for the elaborate study of these storms during an entire season or continuously year after year. During 1882 the plan here indicated was tried by Sergeant Finley and found to be practicable, and in accordance therewith a brief but satisfactory study was made of the tornadoes of that year.

The tornado work of 1882 was confined almost entirely to the States of Arkansas, Missouri, Kansas, Nebraska, Iowa, Illinois, and Michigan. The tracks of the very destructive tornadoes of April 6, April 18, and June 17, occurring in the States of Michigan, Missouri, Kansas, and Iowa, were carefully examined.

While Sergeant Finley was established at Kansas City, Mo., as a base of operations, about 2,500 reports were received by him from special correspondents during the months of May to August, inclusive. Another feature of the work for 1882 was the publication of several circulars and pamphlets; the circulars invited the co-operation of intelligent persons residing in tornado districts in the investigation of tornadoes undertaken by the Signal Service, and furnished such as would accept of the duties imposed, instructions as to the character and extent of the data desired. The pamphlets considered briefly and in a simple manner the various classes of local storms and the distinguishing features of each. A large part of these papers was devoted to a presentation of the peculiar characteristics of tornadoes, conditions of development, and progressive movement, together with suggestions as to the best means for the protection of life and property.

The work of 1882, although essentially preliminary, was in the main productive of very satisfactory results, and laid the foundations for more decisive action and permanent advance in the following year. During 1883 the sickness of Sergeant Finley for two months and a change of station interfered somewhat with a continuation of

tornado studies; but notwithstanding this hindrance a large number of special correspondents were secured, several thousands reports received, and instructions prepared for the establishment of a corps of voluntary observers, to be called "tornado reporters," who should agree to contribute observations, without expense to the Signal Service, to aid in the investigation of tornadoes.

During this year also special circulars of inquiry and instruction were prepared for the purpose of securing the records of past tornadoes and ascertaining the location and nature of "windfalls."

By the end of 1883 over 120 tornado-reporting stations were established.

Early in 1884 a new feature of study was introduced, under the name of preliminary tornado charts, prepared for the purpose of showing the relation between tornado centers and areas of barometric minimum. Four of these charts were issued as a tornado circular, each of which gave a study of the tornadoes occurring on any one day. These preliminary circulars have been prepared for the following dates of tornadoes: February 19, March 11, 25, April 1, 14, 27, 28, May 5, 18, 21, June 7, 8, July 4 and 5, 1884.

Tornado predictions were commenced experimentally on the 10th of March, in compliance with Instructions No. 27, Special Orders February 26, 1884, and continued after April 23, in accordance with Instructions No. 56, Special Orders April 18, 1884. During March and a portion of April predictions were made twice daily, at intervals of eight hours. The first prediction was made from a study of the morning weather maps and covered the eight hours up to 3 p. m. The second prediction was made from a study of the afternoon (3 p. m.) weather maps and covered the eight hours up to 11 p. m.

During the remainder of April and for the month of May and June predictions were made from a study of the morning weather maps and covered the sixteen hours up to 11 p. m.

Some attention has been given to the collection of photographs, sketches, and drawings illustrating the forms of tornado clouds, the detailed progressive movement, and the disposition of *débris* in the tornado's path. Several hundred of such illustrations have been carefully filed in large albums especially prepared to receive them, forming an interesting and valuable record.

For the purpose of preserving a complete numerical record of tornado statistics, elaborate blank books have been prepared. The abstracts are very carefully made, and so classified and indexed that a tornado of any particular date or location can be readily referred to and a brief history of its leading features obtained.

Other books of simpler form are used for entering a brief but complete summary of all the reports received concerning any particular tornado. These books are so arranged that the data contained can be readily referred to for purposes of study.

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## PAPER D.

### PROGRESS IN THE STUDY OF THUNDER-STORMS.

Early in January, 1884, a plan was proposed by Professor Hazen whereby, with the co-operation of the Post-Office and War Departments, detailed data might be collected regarding thunder-storms. This plan received the indorsement of the Postmaster-General and has led to excellent results. Cards were sent to stations 40 miles apart over the whole country east of the one hundred and second meridian and north of the thirty-fifth parallel; they were also sent to stations 10 miles apart in the States of Illinois and Indiana, as representing the West, and also to stations the same distance apart within 150 miles of Washington City; finally, cards were sent to post-offices about 3 miles apart within 50 miles of Washington City. During May and June, 1884, over 2,000 records of storms were received from observers or culled from the daily newspapers. The storms of May 16 to 20 were selected for special study, and a paper was written by Professor Hazen, which has been ordered to be printed as a Signal Service note. The storms of June 6 to 10 were also selected for special study. Daily maps of thunder-storm distribution have been drawn, and these promise to give important results.

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## PAPER E.

### COURSE OF LECTURES DELIVERED BY PROFESSOR UPTON AT FORT MYER.

[The lectures, ten in number, were given on November 26, December 1, 4, 8, and 10-12, 1883. The first seven of these lectures were devoted to the subject of solar radiation

and climate, and were prepared expressly for this class. The method of treatment was as follows:]

#### LECTURE I.

After a brief introduction upon deductive and inductive methods applied to meteorology, the topic of distribution of solar heat was considered. The theories of the sun's constitution and the sources of its energy were explained, and the distribution of heat over the earth's surface, neglecting the effect of the atmosphere, was shown to be dependent upon the sun's altitude, the length of the day, and the distance of the sun from the earth. Numerous illustrations were given in explanation of these topics.

#### LECTURE II.

The modifications in the distribution of solar heat introduced by the atmosphere were next considered, under the heads of general absorption, diffusion, and reflection, and appropriate illustrations were introduced. The measurements of solar radiation or actinometry by the dynamic method was next explained and illustrated by the actinometers of Balfour Stewart, and Violle, which were exhibited to the class.

#### LECTURE III.

The subject of actinometry was further discussed with special reference to the static method. The conjugate thermometers of Mariè Davy and the conjugate bulbs of Violle were exhibited and their theory and use explained.

#### LECTURE IV.

This was devoted to the subject of selective absorption. Especial prominence was given to the recent investigations of Professor Langley. The topic of aqueous absorption was discussed, together with observations of the rain-band with the spectroscope.

#### LECTURE V.

The previous discussion on the distribution of solar heat led to the subject of climate. First, the climatic factors were explained and the division of climate into continental, insular, and mountain were made. The characteristics of continental and insular climate and their causes were pointed out and illustrated.

#### LECTURE VI.

Mountain climate, with its characteristics respecting each of the climatic factors, was discussed, followed by an examination of the modifications of climate due to aerial and marine currents.

#### LECTURE VII.

The preceding lectures having brought the subject down to climate as actually experienced, the subject of climatic statistics was introduced, and it was shown what were the most important meteorological observations from this point of view, and how they can best be arranged and discussed to bring out the condition of any place with regard to climate.

In the above lectures references were made to Newcomb's Astronomy; Yonug's Sun; Radau's Actinometrie; Hann's Klimatologie; Houghton's Physical Geography; Blodgett's Climatology of the United States; and to various articles on the subjects discussed which have been published in scientific journals.

The remaining lectures of the course were upon the subject of time, and were made up in the main from the lectures formerly given on this subject, abstracts of which are published in the Annual Report of the Chief Signal Officer for 1882.

#### LECTURE VIII.

This lecture discussed the measurement of time, explaining the distinction between sidereal and solar time, and also the methods of determining time and longitude.

#### LECTURE IX.

This lecture discussed the distribution of time signals and made special mention of the subject of time balls.

#### LECTURE X.

This was devoted to standard time, and reviewed the history of the efforts to simplify the time standards, with a critical discussion of the various methods proposed.

The state of the subject in this country at the present time was dwelt upon, and also its bearing upon the work of this service.

The lectures were given extemporaneously, an outline of each lecture having first been written upon the blackboard. The blackboard was freely used in the course of each lecture, and a number of charts were also employed for additional illustration. A written exercise, occupying half an hour, was invariably given before each lecture, composed of five questions upon the leading points of the preceding lecture.

## PAPER F.

### SUGGESTED COURSE IN METEOROLOGY FOR SCIENTIFIC SCHOOLS. —

The course should embrace all of the subjects treated of in the following paragraphs, which may, however, be rearranged to suit the necessities of each case:

1. Maintenance by each student of a daily record, as complete as possible, of his own actual observations of weather, wind, &c., for at least one year.
2. Analysis of this same record; construction of wind roses, &c.; determination by inductive methods of some local atmospheric laws.
3. Special observations, *e. g.*, with polarimeter, cyanometer, spectroscope, &c.; work in atmospheric electricity; photography of clouds; terrestrial magnetism, auras, &c., and deduction of special results.
4. Theory and corrections of ordinary meteorological instruments—barometer, thermometer, anemometer, evaporimeter, wet-bulb, hygrometer, &c.
5. Study of United States weather maps and generalizations on a large scale, and empirical prediction of weather for twenty-four hours in advance.
6. Study of meteorological charts for the world, and general ideas as to distribution of temperature, moisture, pressure, winds, &c.
7. Experimental determination of fundamental data, *e. g.*, solar heat and atmospheric absorption, coefficient of expansion of air by heat, latent heat of expansion and condensation, friction of air on air, water, &c., resistance of objects to wind.
8. Theoretical study of fundamental mechanical laws deduced by Ferrel, Guldberg and Mohn, Schoch, Sprung, Weilenmann, Chambers, Thomson, and others.
9. Application of these latter to philosophical deductive methods of predicting weather and seasons.

Beginning with a small meteorological and physical observatory and instruments, all not to cost above \$10,000, it is probable that \$10,000 more would be needed within a year or two as the classes increase and the institution takes a wider range. The higher part of the course presupposes acquaintance with differential and integral calculus, analytical mechanics, thermo-dynamics, &c., all of which are now taught in scientific schools.

## PAPER G.

### QUESTIONS FOR NON-COMPETITIVE EXAMINATION BEFORE THE UNITED STATES CIVIL SERVICE COMMISSION.

#### 1. SUBJECT: *Familiarity with French and German scientific literature.*

(a.) Enumerate the principal French and German scientific treatises that you have studied in the original languages.

(b.) Correct and translate the following extracts, including the references in the foot-note:

Kirchoff, *Mechanik*, 13. Vorlesung. Die tropf baren Flüssigkeiten zeigen gewisse Erscheinungen, die man Capillar-Erscheinungen nennt und als Wirkungen der Capillarkräfte ansieht. Laplace hat die erste Theorie der Capillarercheinungen aufgestellt und ist bei dieser von der Hypothese ausgegangen, dass die Capillarkräfte Kräfte sind mit denen die Theile der Körper einander anziehen, und die bei wachsender Entfernung so schnell abnehmen, dass sie bei messbarer Entfernung nicht mehr merklich sind. Dieselbe Hypothese hat später Gauss\* strenger verfolgt als es von Laplace geschehen ist und ist dadurch zu einem Principe geführt, das wir folgendermassen ausprechen können.

Wenn zwei verschiedenartige Körper in einer Fläche sich berühren so wirken in Folge hiervon Kräfte, die ein Potential haben, welches gleich der grössere der Berühr-

\* *Principia generalia theoriæ figuræ fluidorum in statu æquilibrii*: Carl Friedrich Gauss' Werke, Bd. V, p. 20.

rungefläche, multiplicirt mit einer von der Natur der beiden Körper abhängigen Constanten ist. Diese Kräfte sind die Capillarkräfte.

Translate the following extract:

(c.) Mascart, *Traité d'Electricité Statique*, Chapitre VI.

Nous n'avons employé jusqu'à présent dans le calcul des phénomènes électriques que des considérations élémentaires, des raisonnements directs empruntés pour la plupart à Coulomb mais on est bientôt arrêté dans cette voie on ne peut évaluer ainsi les actions qui s'exercent entre deux corps électrisés que dans des cas tout à fait particuliers, et il n'est presque aucun phénomène de condensation dont on puisse rendre compte d'une manière entièrement satisfaisante. Il est donc nécessaire d'avoir recours à des méthodes de calcul plus générales.

2. SUBJECT: *Mathematics, including the theory of errors.*

(a.) Given the angles  $B$  and  $C$  and the side  $a$  of a plane triangle. Required, the formula or method of finding the angle  $A$  and sides  $b$  and  $c$ .

(b.) Deduce the equation of the circle referred to rectangular axes, having the origin at the center, and again having the origin in the circumference.

(c.) Explain the general method of determining the maximum and minimum values of any function and illustrate this by application to the equation  $y = 3x^3 - 2x^2$ .

(d.) What is the fundamental principle of the method of least squares?

(e.) Given the following individual measures of a certain quantity:

38.91	39.04	39.35	39.32
39.32	39.57	39.25	39.40
38.93	39.46	39.14	39.33
39.31	39.30	39.47	39.28
39.17	39.03	39.29	39.62

Find the mean error of the arithmetical mean of these measures.

3. SUBJECT: *Mechanics, synthetic and analytic.*

(a.) State and explain the principle of virtual velocities.

(b.) State and explain the principle of conservation of areas.

(c.) Show that in a compressible atmosphere the altitudes vary as the logarithms of the pressures.

4. SUBJECT: *Theory of instruments:*

(a.) Give the formula or the method for correcting the observations of stars with the meridian-transit instrument and deducing the proper clock correction.

(b.) Explain all important sources of error in the use of the barometer and the corrections needed for reduction to standard gravity.

(c.) Explain the method of determining the horizontal magnetic intensity by the method of deflections.

5. SUBJECT: *Molecular physics:*

(a.) Explain the influence on velocity of sound, of the compression and expansion of the air in front and rear of an advancing wave of sound, and state the amount of, or formula for Laplace's correction of Newton's theory.

(b.) State and illustrate the laws of cooling by radiation, known as Newton's and Dulong and Petit's.

(c.) Explain the ordinary law of refraction of light at a single bounding surface and deduce the fundamental differential equation for the refraction of rays entering the earth's atmosphere.

(d.) State Ohm's law and explain and illustrate its application in Wheatstone's bridge and in the location of faults in telegraph lines.

6. SUBJECT: *Meteorology:*

(a.) What is the best means by which to illustrate and comprehend the general distribution of temperature, pressure, &c., over the earth's surface? Draw these lines on the accompanying map.

(b.) What are the general relations between gradients and winds as to directions and intensity?

(c.) By what process is the air ordinarily cooled sufficiently to produce rain?

(d.) What are the best methods for determining the amount of aqueous vapor in the air?

(e.) How does the diurnal rotation of the earth affect the motions of the air?

(f.) What hypotheses as to the origin of atmospheric electricity are probably erroneous and what do we know as to its origin?

7. SUBJECT: *Mathematical computations:*

(a.) Calculate the values of  $y$  for each fifth degree from  $10^\circ$  to  $20^\circ$  in the series of values of the angle  $A$ .

$$Y = (3A - 4 \sin A)^\circ.$$

[The computation should be systematically and neatly arranged. Bowditch's "Useful Tables" is supplied for your use.]

8. SUBJECT: *Personal experience and ability:*

- (a.) Enumerate your published original investigations.
- (b.) Enumerate some of your unpublished or proposed original studies.
- (c.) Give an analysis of the course of reasoning, experiments, and results embodied in some one of the above titles under (a) and specify the points needing further study in order to confirm the results.
- (d.) Suggest a course of study proper to elucidate some doubtful point in the laws of the paths pursued by local storms.

## PAPER H.

## QUESTIONS FOR COMPETITIVE EXAMINATION BEFORE THE UNITED STATES CIVIL SERVICE COMMISSION.

[Army Signal Office, Series No. 1.—Special Examination.]

## SUBJECT: TRANSLATION FROM FRENCH.

Question 1.—Translate the following after correcting any errors that may be noticed:

Le Service Américain Des Signaux. Si l'on a le droit de dire que l'idée de faire servir le baromètre à la prévision du temps est éminemment française, on doit reconnaître que c'est aux Américains que l'on doit l'idée féconde de réunir en un seul faisceau les forces de plusieurs nations pour étudier en commun les grands problèmes dont s'occupe la Météorologie. Des le 9 février 1852, M. Walah, consul des Etats-Unis à Paris, communiquait à Arago une série de documents officiels établissant l'avantage qu'il y aurait à adopter un système uniforme d'observation. A la suite de cette ouverture, un Congrès météorologique se réunis sait, en août 1853, à Bruxelles, sous la présidence de M. Quetelet.—[De Fonvielle—La Prévision du Temps p. 39-40.]

## SUBJECT: TRANSLATION FROM GERMAN.

Question 2.—Translate the following after correcting any errors that may be noticed:

Die Formel 3) habe ich mit den Resultaten mehrerer Versuche verglichen und mit denselben in Übereinstimmung gefunden, damit also zugleich den experimentellen Nachweis für die Anwendbarkeit der Formel 1) auf den betrachteten Verdampfungsprocess gegeben. Die Formel 1) bildet zugleich die Grundgleichung für die mathematische Behandlung der stationären Verdampfungsprocesses überhaupt. Wenn irgend eine Oberfläche einer Flüssigkeit in einer Atmosphäre sich befindet, welche mit dem Dampfe der Flüssigkeit nicht gesättigt ist, so wird aus der Oberfläche Dampf in die Atmosphäre eintreten, und wenn die äusseren Bedingungen es gestatten, auch ein stationärer Zustand der Verdampfung sich einstellen. Dieser wird folgende eigenthümlichkeiten darbieten.—[Stefan, Wien Sitzung-berich, LXXXIII, 1881.]

## SUBJECT: MATHEMATICS.

Question 1.—Deduce the general formula for the cosine of any side of a spherical triangle in terms of the other sides and the opposite angle.

Question 2.—Deduce the polar equation of the ellipse, the pole being at the center.

Question 3.—Find the maximum and minimum values of  $u$  in the equation.

$$u = a \sin X + b \cos X.$$

Question 4.—Integrate by development into an infinite series the expression:

$$u = \int \frac{dx}{\sqrt{1-x^2}}$$

Question 5.—The probable error of the average of 10 measures of a quantity is  $\pm 0.015$  and the mean error of the average of 15 other measures is  $\pm 0.018$ . What is the probable error of the average of these two results, giving each a weight depending on its respective probable error?

## SUBJECT: MECHANICS.

Question 1.—Prove that the time of vibration of a simple pendulum is  $T = \pi\sqrt{\frac{l}{g}}$

Question 2.—Prove that the atmospheric pressures at the elevations  $x_1$  and  $x_2$  above sea-level are connected by the formula  $\log \frac{p_1}{p_2} = A(x_2 - x_1)$



Question 3.—Explain the cause of the phenomenon in the flow of liquids known as the *vena contracta*.

Question 4.—State the general principles of the kinetic theory of the constitution of gases.

#### SUBJECT: THEORY OF INSTRUMENTS.

Question 1.—State the sources of error in thermometers and in the various methods of determining the temperature of the air.

Question 2.—Explain a method of calibration and calculation of the calibration errors of thermometers.

Question 3.—Explain the method of determining the tension of any air that may be present in the vacuum chamber of a mercurial barometer.

Question 4.—Explain the theory of the optical principles involved in the ordinary astronomical sextant.

Question 5.—Explain the method of determining the dip of the magnetic needle by the use of the dip-circle.

#### SUBJECT: MOLECULAR PHYSICS.

Question 1.—Define the terms "*specific* heat at constant pressure," and "*specific* heat at constant volume," and state what is the ratio of the values of these for simple gases.

Question 2.—Give the formula for the total quantity of heat expressed in calories required to transform water at zero into vapor at the temperature  $T$ .

Question 3.—Explain the thermo-dynamic principle by virtue of which dry air cools as it rises in the atmosphere.

Question 4.—Explain in general terms the theory of the origin of bright and dark bands in the spectrum.

Question 5.—Explain the method of determining the temperature of a distant coil of wire by counterbalancing its resistance to the passage of an electric current.

Question 6.—Waves of sound proceed simultaneously from all parts of a long straight flash of lightning; find the law according to which the intensity of the thunder will increase or diminish as heard by any observer.

Question 7.—Explain the formation of optical diffraction bands or fringes.

#### SUBJECT: METEOROLOGY.

Question 1.—At what latitude is the greatest amount of solar heat received in 24 hours on the 21st of June by a horizontal surface at the upper limit of the earth's atmosphere?

Question 2.—Give a diagram presenting the diurnal variations of the barometric pressure, and show what combination of two observations will give a good daily mean pressure.

Question 3.—Describe the general distribution of temperature, wind, and pressure over the North Atlantic Ocean during July.

Question 4.—Explain the general cause of the low pressure in the Arctic, Antarctic and equatorial regions.

#### SUBJECT: NUMERICAL COMPUTATIONS.

Question 1.—Compute the values of  $y = \sqrt[5]{144 - (16-x)^3}$  for the successive values of  $x$  from 0 to 10.

[Logarithmic tables must be used and the work must be arranged in a neat form.]

#### SUBJECT: PERSONAL EXPERIENCE AND ABILITY.

[The following questions form the second part of this examination; they may, if the candidate prefer, be taken home by him and answered after free reference to such books as he may choose to consult, the object being to illustrate his readiness in collecting data and investigating special subjects. He is required to compile his replies without consulting with any other person. The replies must be communicated by mail or in person on or before the second of May to the "Civil Service Commission, Washington, D. C.," and be accompanied by a letter in a separate envelope stating that they have been compiled without consultation with any person, but solely rely-

ing upon published books and the candidate's own knowledge. They must be written on sheets to be furnished herewith.]

Question 1.—Enumerate the scientific publications that you have carefully read in the original languages.

Question 2.—Enumerate the titles of any considerable scientific publications of which you are the author, in whole or in part. [Give references to the places of publication of each.]

Question 3.—State the nature and extent of your work and experience in pure or applied science.

Question 4.—Submit a synopsis of some proposed new and original course of investigation of some subject bearing on meteorology or its applications.

Question 5.—Submit an investigation deducing a formula for correcting, for instrumental temperatures, the readings of a barograph constructed as follows: A steel siphon barometer-tube of uniform bore rests on a bed-plate to which is also attached a vertical brass frame supporting a revolving vertical brass drum, on which latter are recorded the oscillations of the upper end of a light glass rod whose lower enlarged end floats on the surface of the mercury in the short open leg of the siphon.

Question 6.—Submit a sketch of a memoir, with illustrative diagrams, showing the latest results of observations on the frequency and distribution of auroras over the northern hemisphere. [A sketch of the contents of each chapter of the memoir will suffice, but you will be expected to give full references to any authorities whence the needed information can be obtained.]

Question 7.—Submit a sketch of a memoir on the various methods of determining the heights of the clouds and the results of actual observations on this subject. [In the absence of any desired book of reference, name the work to which you would refer as authority or as containing the needed observations.]

Question 8.—Submit a sketch of a memoir on the influence of a body of water, such as the lakes or the ocean, upon the temperature of the air over and around it, taking account of solar radiation, atmospheric absorption, evaporation, vertical currents, cloudiness, rainfall, fog, direction and force of the wind, melting of snow and ice, ocean currents, &c.

[Give, as before, full references to the authorities on these subjects.]

## APPENDIX 5.

### REPORT ON UNITED STATES MILITARY TELEGRAPH LINES, FOR THE YEAR ENDING JUNE 30, 1884.

SIGNAL OFFICE, Washington, June 30, 1884.

The total number of miles of line in operation at the beginning of the year was 2,864; 53 miles of new line were built during the year, and 112 miles abandoned, leaving 2,805 miles in operation at the present date, distributed as follows, viz:

	Miles.
California and Arizona Division .....	510
Department of the Missouri .....	693
Northwestern Division .....	893
Texas Division .....	197
Washington and Idaho Division .....	500
San Francisco Harbor .....	12

The total line receipts during the year were, for this line, \$14,891.90; for other lines, \$24,111.86. As anticipated in last year's report, the withdrawal of detailed men of the line of the Army from permanent duty with the military telegraph lines as operators and repairers, and the small force of Signal Corps men available for such duties, have seriously embarrassed this office in maintaining some of the more isolated sections in a proper state of efficiency. While such temporary assistance as is permitted under the provisions of General Orders No. 35 of 1883, and No. 3 of 1884, Adjutant General's Office, has usually been given freely by department and post commanders, yet men thus temporarily detailed, for a few days only, and without additional pay for such extra labor, could not be expected to do as efficient and lasting work as men permanently detailed, fitted by experience, and receiving just compensation, would have performed. Besides, the delay occasioned in applying for and getting ready a detail to start out on the line when a break occurred occasioned at times interruptions of much longer duration than would have been the case had there been permanent repairmen ready to mount and start out at a moment's notice. Another point is to be considered in this connection. On some of the lines in Texas, New Mexico, and Montana it is almost impossible to hire labor when the operator is unable to make proper repairs alone, or if labor can be had, the price asked is so excessive that the means at the command of this office will not permit its payment; so that either the repairs have to be made poorly by one man or the line has to remain open until the commanding officer at the nearest post can furnish a detail.

In view of the foregoing it is recommended that a law be secured permitting the permanent detail of 50 enlisted men from the line of the Army for duty with the military lines, and payment of extra-duty pay to the same from line receipts, as in former years.

Below follows a report of the operations and present condition of the several divisions:

#### CALIFORNIA AND ARIZONA DIVISION.

Capt. G. T. Olmsted, U. S. A., who had charge of this division at date of last report, was relieved August 14, 1883, by First Lieut. Marion P. Maus, First Infantry, acting signal officer, who remains in charge.

The number of miles of wire in operation at the beginning of the fiscal year was 512; of this number 47 miles were abandoned as no longer necessary for military purposes, and 8 miles, from Fort Cummings to Florida Station, were transferred to another division October 31, 1883. Fifty-three miles of new line were built during the year, making a total of 510 miles in operation at the present date, divided into the following sections or circuits, viz:

	Miles.
Maricopa and Prescott section .....	230
Fort Bowie and Fort Apache section .....	216
Tucson and Fort Lowell section .....	7
Fort Huachuca and Huachuca section .....	7

The construction of a commercial line connecting Fort Bayard with Silver City, N. Mex., rendered unnecessary the military line between Forts Bayard and Cummings, which, being old and in poor condition, was therefore abandoned during the month of October, 1883, and sold at public auction January 2, 1884. The line between Fort Bayard and Lordsburg, which had been abandoned during last fiscal year, was similarly disposed of October 17, 1883.

In order to insure reliable communication at all times to the department headquarters at Whipple Barracks, a new line, 53 miles in length, was constructed between Prescott and Ash Fork, a station on the Atlantic and Pacific Railroad. This line affords a convenient outlet for Prescott, especially in case of interruption on the line south to Maricopa, distant 160 miles, which was formerly the only outlet for this section. It is built entirely of iron poles and excellent wire. Work began January 14, and the line was completed and in operation March 7, 1884.

Following is a brief description of the sections constituting the California and Arizona Division:

#### MARICOPA AND PRESCOTT SECTION.

Offices at Ash Fork, Fort Verde, Prescott, Wickenburg, Phoenix, Fort McDowell, and Maricopa. Section is maintained to afford telegraphic communication to department headquarters and the posts at Forts Verde and McDowell; also as an outlet for the meteorological reports from Prescott. Extensive repairs were made on this section between Prescott and Phoenix during August and September, 1883, and again in March and May, 1884, after a series of destructive storms and floods. The line between Prescott and Fort Verde, being old, was almost entirely rebuilt during June. The whole section between Ash Fork and Maricopa is now in excellent condition and will probably need very little repairs during the coming year. All the labor of building the new line and making general repairs was done by troops, with but little expense to this service.

#### FORT BOWIE AND FORT APACHE SECTION.

Offices at Fort Apache, Fort Thomas, San Carlos, Fort Grant, Willcox, and Fort Bowie. Section affords telegraphic communication to the posts named and an outlet for meteorological reports from Fort Apache. This section has been, by constant repairs, kept in fair condition, but stands now in need of general repairs. Nine hundred iron poles, 1,000 insulators and 30 miles of new wire were ordered shipped from here to Willcox during May, and but for the delay in the arrival of this material, repairs would have been made before the end of the fiscal year.

#### TUCSON AND FORT LOWELL SECTION.

This section is operated as a telephone line, and the instruments and service are rented from the Arizona Telephone Company at an annual rental of \$50. The line has been thoroughly repaired, and gives satisfaction in all respects.

#### FORT HUACHUCA AND HUACHUCA SECTION.

This section is also operated by telephone, the rental of instruments being paid by the Quartermaster's Department. It has needed no general repairs during the year. Following were the receipts of the California and Arizona Division during the year, viz:

Receipts for this line .....	\$5,377 40
Receipts for other lines .....	11,810 31

Besides the commercial business, an immense amount of official and "dead-head" business was done, the aggregate money value of which amounted to \$5,444.45.

[Extract from annual report of Lieutenant Mann.]

" \* \* The department commander has expressed himself as entirely satisfied with the military telegraph lines since my assignment to duty as officer in charge, and stated that the trouble he had complained of during the time of my predecessor had entirely disappeared and that the lines were in all respects satisfactory. Every assistance has been rendered by the department commander in repairing the telegraph lines, and it is confidently believed that no further trouble will be experienced in maintaining the necessary military telegraph service in this division."

#### LINE IN THE DEPARTMENT OF THE MISSOURI.

Lieut. W. A. Glassford, Signal Corps, continued in charge of this division until November 30, 1883, when he was transferred to the central office. The short, isolated sections, a few miles in length only, and each connecting a military post with the

nearest commercial office, were equipped as telephone lines and turned over to the post commanders. The Signal Corps operators at such posts were relieved and transferred to other points. The larger sections, connecting two or more posts, were retained as Morse lines, and are now operated under the immediate supervision of the chief operators, subject to the orders of the telegraph officer at this office.

The following lines abandoned during the previous year were sold at public auction, viz: Gunnison to Uncompahgre, 81 miles, July 28, 1883; Rawlins to Camp on White River, 144 miles, September 15, 1883. The total number of miles of line in operation at the beginning of the year was 685; received by transfer during the year, 8 miles (Fort Cummings to Florida Station); total now in operation, 693 miles, comprised in the following circuits or sections:

	Miles.
Indian Territory lines .....	438
Fort Thornburg to Carter Station .....	90
Fort Stanton to San Marcial .....	121
Fort Union to Watrous .....	9
Fort Lewis to Durango .....	15
Uncompahgre to Montrose .....	9
Fort Cummings to Florida Station .....	8
Fort Wingate to Wingate .....	3

The first three named sections are operated as Morse lines by Signal Corps operators. The other sections were equipped as telephone lines and operated as such with varying success, this service employing a joint operator at each transfer point, except at Wingate, where the Quartermaster's Department pays all expenses of the telephone service. Between Fort Lewis and Durango, the telephones supplied by this office have been in continuous use and have worked very satisfactorily. Improper ground connections caused trouble at first, but since a copper ground is used the line is working well.

Between Fort Wingate and Wingate, Bell telephones are used with satisfactory results.

Between Fort Union and Watrous the line is again operated with Morse instruments, the telephones supplied from this office not having proved satisfactory. An enlisted man of the post acts as operator at Fort Union.

A similar report has been received concerning the Uncompahgre-Montrose line, but the present officer in charge ascribes the failure of the telephones to inexperience on the part of those attempting to use them, and recommends another trial by men familiar with their use.

At Fort Cummings ineffectual attempts were made to operate the telephone with Florida station. The line is again worked as a Morse line with the officer in charge as operator. This line will probably be abandoned in the near future.

With one exception, the regular Morse lines manned by Signal Corps men were operated with but ordinary interruptions throughout the year. Heavy snows in the mountains between Forts Bridger and Thornburg made repairs impossible during part of the winter and spring, but as Fort Thornburg has not been garrisoned since the fall of 1883, no serious inconvenience resulted from the interruption. Below follows a brief description of each Morse section:

#### INDIAN TERRITORY SECTION.

Offices at Dodge City, Kans., Fort Supply, Ind. T., Fort Elliott, Tex., Cantonment, Fort Reno, Fort Sill, Ind. T., and Henrietta, Tex. Is maintained to furnish telegraphic communication to the posts named, also for transmission of weather reports from Forts Elliott and Sill. This section is liable to many interruptions from prairie fires, thunder-storms, floods, and malicious acts of cowboys and outlaws, but repairs are made with but little delay, as the commanding officers at the various posts are always very prompt in furnishing details and transportation whenever called upon. The section has now a large proportion of iron poles, which are exempt from damage by lightning and prairie fires, and is generally in good repair except at the river crossings, where recent floods have done considerable damage. The spans across the Canadian River between Forts Elliott and Supply, and between Forts Reno and Sill, were carried away about the 1st of June, and owing to continued high water temporary repairs could be made only. A new supply of steel wire has been ordered shipped for these spans, and the best possible repairs will be made as soon as the waters subside, but the spans will always be at the mercy of the next high water. Cables are out of the question in the shifting quicksands, and there seems to be no complete remedy for these periodical breaks within the limited means at the command of this office.

#### FORTS THORNBURG AND BRIDGER SECTION.

Offices at Forts Thornburg and Bridger, with the transfer office at Carter Station, Wyo. This section was operated by the Quartermaster's Department until June 30,

1883, when it was turned over to the Signal Service. General repairs to the whole line were made by Captain Penney, of the Sixth Infantry, during the fall of 1883, and the line worked satisfactorily until February, when the mountains became impassable, and repairs between Fort Bridger and Fort Thornburg had to be suspended. Communication between Fort Bridger and the transfer office at Carter was, however, not interrupted. Temporary repairs between Bridger and Thornburg were made on snow-shoes during April, and the line will receive a thorough overhauling as soon as the snow has melted. The repair station at Young's Spring, midway between Bridger and Thornburg, has been discontinued, but as the line cannot be satisfactorily maintained without an intermediate station, it should be re-established if Fort Thornburg is again occupied by troops.

#### FORTS CRAIG AND STANTON SECTION.

Offices at Forts Craig and Stanton; transfer office at San Marcial, N. Mex. No serious trouble occurred on this section until May, when, owing to the great rise in the Rio Grande, part of the line between Fort Craig and San Marcial was submerged. Steps have been taken to string our wire on the Western Union poles from the railroad crossing to San Marcial, which will prevent similar trouble in the future. During the continuance of the flood the Fort Craig operator crossed the river once a day to send and receive the Fort Stanton business. This line was largely built of old material recovered from abandoned lines, and some 50 miles on the Fort Stanton repair section were built of pine poles, which are now rotting rapidly. On the Fort Craig section the poles are mostly cedar and few need replacing. One thousand iron poles have been ordered shipped, and general repairs will be made along the whole line as soon as the poles are all distributed.

Following are the line receipts of the Department of the Missouri lines during the year, viz:

Receipts for this line .....	\$2,077 14
Receipts for other lines .....	3,244 79

#### TEXAS DIVISION.

Second Lieut. L. E. Seabree, Signal Corps, remained in charge until December 31, 1883, when he was transferred to Washington. The lines in Texas have since been under the direct control of the officer in charge of the telegraph division of this office, with the local management of sections in charge of the chief operators.

The extensive abandonment of lines in this division during the preceding year left but 263 miles in operation at the beginning of the present fiscal year, and this was still further reduced by the abandonment on September 5, 1883, of the line from Fort Concho to Coleman, 65 miles long. A private company, purchasing and operating the abandoned military line between San Antonio and Fort Concho furnished all necessary telegraphic facilities to the latter post, and the line to Coleman was, with the approval of the department commander, abandoned as above stated. This leaves only two sections in operation at the present time, namely, Brownsville to Rio Grande City, 100 miles, and Fort Stockton via Fort Davis to Marfa, 97 miles. Total in operation, 197 miles.

Of the lines abandoned during the preceding and current years, only portions of one section were recovered, viz, 68 miles between Eagle Pass and Rio Grande; the remaining sections, under authority from the Secretary of War, were sold at public auction as follows, viz:

Section.	Length.	Date of sale.
	<i>Miles.</i>	
Henrietta to Coleman .....	181	July 20, 1888
Fort Concho to Fort Stockton .....	158	July 20, 1888
San Antonio to Fort Concho .....	222	July 20, 1883
San Antonio to Eagle Pass .....	167	July 20, 1888
Coleman to Fort Concho .....	65	Oct. 20, 1883
Part of line, Eagle Pass to Rio Grande .....	127	Dec. 5, 1883
Total .....	920	

Following is a brief description of the remaining sections, viz:

#### BROWNSVILLE TO RIO GRANDE CITY.

Offices at Brownsville, Edinburg, and Rio Grande City. Section affords telegraphic communication to Forts Brown and Ringgold and the sub-post at Edinburg, also an outlet for meteorological reports from Rio Grande City. Section has worked satis-

factorily and is in good condition. Most of the wooden poles have been replaced by iron ones recovered from the abandoned line above Rio Grande City. Near La Blanca the line was moved back from the river bank to prevent being washed out. All of the labor in keeping up line is performed by details from posts, and the expenses for repairs have been very light.

#### FORT STOCKTON TO MARFA.

Offices at Forts Stockton and Davis; transfer office at Marfa. Supplies telegraphic communication to the posts named and an outlet for meteorological reports from Fort Stockton. The line has worked satisfactorily during the year, but on account of decaying poles stands in need of a thorough overhauling between Davis and Stockton. The necessary material is on the spot, and general repairs will be made by troops during July. A large number of iron poles will be used to replace defective wooden ones. Between Fort Davis and Marfa the line is reported in excellent condition, being entirely on iron poles.

Following are the receipts in the Texas division during the year, viz:

Receipts for this line .....	\$1,692 64
Receipts for other lines .....	1,961 42

#### WASHINGTON AND IDAHO DIVISION.

Second Lieut. Frank Greene, Signal Corps, remained in charge of this division until June 30, 1884, when he was assigned to other duty, and the local supervision of the various sections given to the chief operators acting under direct orders from this office.

The Fort Klamath section, 223 miles long, was transferred to this division June 30, 1883, and the sections from Pomeroy to Spokane Falls, and from Fort Cœur d'Alene to Summit, were abandoned on the same date, leaving a total of 500 miles in operation during the year, divided into sections or circuits as follows, viz:

	Miles.
Dayton, Wash. T., to Fort Lapwai, Idaho .....	68
Port Angeles, Wash. T., to Tatoosh Island, Wash. T. ....	80
Astoria, Oreg., to Fort Canby, Wash. T. ....	28
Fort Spokane, Wash. T., to Fort Cœur d'Alene, Idaho .....	91
Fort Bidwell, Cal., to Ashland, Oreg. ....	233

The sections abandoned during the preceding year were, by authority of the Secretary of War, sold at public auction on August 25, 1883.

The station on Tatoosh Island was connected by a strong three-conductor cable, 2 miles long, with the land line terminating at Cape Flattery. The line from the cape to Port Angeles had been completed and equipped since March, 1883. Various causes delayed arrival of cable, which was laid November 10, 1883, by First Lieut. James Allen, 3d Cavalry, acting signal officer and assistant, and has worked faultlessly up to the present time.

Another cable, 4 miles in length, was laid by the same officer on October 10, 1883, across the mouth of the Columbia River, forming part of the military telegraph line connecting Astoria, Oreg., with Forts Stevens and Canby. This cable was washed out at the northern end during December, when a quarter of a mile of new cable was spliced on and the end carried back to high ground, since when communication through it has been uninterrupted.

Substantial and comfortable houses were built upon the light-house reservations at Fort Canby and on Tatoosh Island, which are now occupied by our men as meteorological and telegraph offices.

Following is a brief description of the several sections constituting the Washington and Idaho Division, viz:

#### DAYTON AND FORT LAPWAI SECTION.

Offices at Dayton, Lewiston, and Fort Lapwai. Section is maintained for the purpose of affording telegraphic communication to Fort Lapwai. Line has been kept in fair condition with ordinary repairs, but many poles are now becoming rotten and need resetting. General repairs were delayed upon the recommendation of Lieutenant Greene, as the abandonment of Fort Lapwai rendered it doubtful whether this section should be retained after the withdrawal of the troops. The department commander having urgently recommended maintenance of section, steps have been taken to have it repaired before winter. The stations were inspected during the year by Lieutenant Greene and found in good condition.

## FORT SPOKANE AND FORT CŒUR D'ALENE SECTION.

Offices at Fort Spokane, Spokane Falls, and Fort Cœur d'Alene. Section is maintained to afford telegraphic communication to Forts Spokane and Cœur d'Alene. General repairs were made to section during September and again in June, and it is now reported in good condition. Decaying poles will have to be replaced during next spring. The stations were inspected by Lieutenant Greene in September and found in good condition, excepting Spokane Falls, which required a change of operators to bring it up to the standard.

## CAPE FLATTERY SECTION.

Offices at Port Angeles, Pysht, Neah Bay, and Tatooch Island, with repair stations at Crescent Bay and Hoko. Section is maintained to transmit weather and vessel reports from Tatooch Island, which station communicates by means of the international code of signals with vessels passing in and out of the straits of San Juan de Fuca. Although passing through a wilderness, densely wooded, the line has been kept working with but few interruptions, and has given much satisfaction. General repairs were made on the Port Angeles and Crescent Bay sections, where fires and a landslide did some damage; other sections required ordinary repairs only. Trails are being cut by repairmen, and the whole section is reported in very good condition.

## ASTORIA AND FORT CANBY SECTION.

Offices at Astoria, Fort Stevens, and Fort Canby. Section is maintained to furnish telegraphic communication to Forts Stevens and Canby, also for the transmission of meteorological, vessel, and bar reports from the Canby station. A large flagstaff is erected upon the highest ground near Fort Canby, and by means of the international code of signals vessels passing in and out of the Columbia River are communicated with. The condition of the bar is reported thrice daily in a special message to the Portland, Oreg., Chamber of Commerce, which reports prove of value to merchants, shippers, and pilots. General repairs to section were made during May, and the line is now in excellent condition. Offices were inspected by Lieutenant Greene in September and found in good condition.

## FORT KLAMATH SECTION.

Offices at Ashland, Linkville, Fort Klamath, Lakeview, and Fort Bidwell. Section furnishes telegraphic communication to Forts Bidwell and Klamath, with transfer office at Ashland. A repair station was maintained at Parker's, Oreg., near the summit of the Cascade Mountains, during the winter, which proved very useful in speedily reaching the location of the most frequent breaks. This station should be re-established during next winter, say from December 1 to April 30. General repairs were made to different portions of the line, some by troops and some by hired labor. The line is reported as being at present in a very fair condition except at points between Linkville and Fort Klamath, and between Lakeview and Fort Bidwell, where many poles are rotting. About 40 miles of wire between Linkville and Ashland, over the Cascade Mountains, is on trees, the swaying of which causes frequent breaks. Tree brackets and insulators have been recently sent to Fort Klamath, which will be used on the mountain section, doubtless effectually.

The offices on this section have not been inspected.

[Extracts from Lieutenant Greene's report.]

"During the year telegraphic communication has been constant, with the exception of occasional interruptions caused by accidents, such as all telegraph lines are liable to meet, and the lines, both those that were maintained for purposes of military communication and those for purposes more intimately connected with meteorological and marine interests, have very eminently fulfilled their office.

"Whenever the active aid of the Army has been necessary, whether to furnish operators temporarily or details for repairs of greater extent or magnitude than the signal force could perform, I have found it only necessary to ask the proper authorities for assistance to receive it promptly and cheerfully."

Following are the receipts in the Washington and Idaho Division during the year, viz:

Receipts for this line .....	\$2,276 31
Receipts for other lines .....	2,532 01



## SAN FRANCISCO HARBOR.

As mentioned in last year's report, the land portion of the line connecting the Presidio with Alcatraz and Angel Islands was completed during November, 1882. The necessary cables to complete the circuit did not arrive at San Francisco until the following August. They were successfully laid by Lieut. James Allen, on September 19, 1883. On December 29, the cable between Alcatraz Island and Fort Mason was broken by the fouling of a ship's anchor. It was taken up, repaired, and relaid from Alcatraz Island to the Presidio wharf instead of to Fort Mason. It is believed that as now laid the liability of cable to injury is reduced to a minimum.

This line of wire and cables runs from the western shore of Angel Island across that island to Point Blunt, thence by a very strong three-conductor cable to Alcatraz Island; across the island and by a similar cable to the Presidio wharf, thence to the Presidio. A loop connects Fort Winfield Scott with the Presidio, thence the line runs to Fort Mason, its terminus. The total length of cables used is  $4\frac{1}{2}$  miles, of land lines  $7\frac{1}{2}$  miles. The line is operated entirely by the local military authorities, and the Signal Service has no offices in connection with it.

## NORTHWESTERN DIVISION.

Second Lieut. W. D. Wright, Signal Corps, has remained in charge of this division during the year. Of the 1,184 miles of line ordered abandoned by instructions No. 59, series 1883, this office, 1,061 miles were, by authority of the Secretary of War, sold as public auction during the year; the remainder, 123 miles, between Bismarck and Fort Yates, was withheld from sale and is still in operation. Following are the sections sold at the dates named, viz:

Section.	Length.	Date of sale.
	<i>Miles.</i>	
Glendive to Terry's Landing, Mont.....	168	Sept. 15, 1883
Missoula, Mont., to Summit, Idaho.....	114	Sept. 15, 1883
Fort Custer to Helena, Mont.....	282	Sept. 15, 1883
Fort Bennett to Fort Meade, Dak.....	160	Dec. 23, 1883
Bismarck to Fort Buford, Dak.....	208	Dec. 23, 1883
Helena to Missoula, Mont.....	110	Mar. 15, 1884

The line between Missoula and Fort Missoula, 4 miles, was turned over to the post commander, together with the necessary instruments and battery material, and is operated for the convenience of the post, without expense to this service.

There now remain in operation under Lieutenant Wright 893 miles of line, divided into sections or circuits as follows, viz:

	<i>Miles.</i>
From Fort Assinaboine to Helena .....	208
From Fort Maginnis to Glendive.....	367
From Bismarck to Fort Bennett .....	182
From Fort Custer to Terry's Landing .....	30
From Fort Meade to Deadwood.....	15
From Fort Totten to Larimore.....	68
From Fort Sisseton to Webster .....	23

Excepting the sections between Fort Maginnis and Poplar River, and between Fort Meade and Deadwood, but little delay from breaks and other causes occurred during the year. Lieutenant Wright estimates that for needed general repairs in his division during the coming year about 670 poles will be required, at a total cost, including transportation, &c., of \$1,255.

Following is a brief description of the several sections constituting the Northwestern Division:

## FORT ASSINABOINE TO HELENA.

Offices at Forts Assinaboine, Benton, Shaw, and at Helena, the latter being the transfer point to other lines. Section is maintained to furnish telegraphic communication to the post named, also as an outlet for meteorological reports from Fort Assinaboine. The line is reported in fair condition, but will require new poles in the near future. The majority of the old poles will have to be reset and some 150 new ones put up before winter sets in.

## FORT MAGINNIS TO GLENDIVE.

Offices at Fort Maginnis, Camp Poplar River, Fort Buford, and transfer office at Glendive. Between Glendive and Camp Poplar River the line has worked satisfactorily and with few interruptions, but it was found impossible to maintain the Fort

Maginnis-Poplar River section during the winter months. This section, 232 miles long, runs through a country almost destitute of wood and water, and requires a much larger force than this service can furnish to maintain it in a state of efficiency at all times. Outlaws infest the country, who frequently cut the line and render it unsafe for any but large parties to traverse it. During the month of May a repair station was established at Galpin and two civilians are now stationed there to keep the line in repair. At the same time strong details left Fort Maginnis and Poplar River and put the line in thorough order. Since June 1 it has been working with but slight interruptions, but the present repair force will not be able to maintain it during the coming winter.

#### BISMARCK TO FORT BENNETT.

Offices at Bismarck, Fort Yates, Fort Sully, and Fort Bennett. Section is maintained solely for military purposes and has two outlets, viz, Bismarck and Fort Sully. Communication with Fort Bennett has again been interrupted by the breaking of the crossing over the Missouri River. A span of over half a mile has to be made at that point and great difficulty is experienced in maintaining it. Cabling the river proved a failure some years ago. Lieutenant Wright recommends he be ordered there to personally superintend the construction of a new crossing and see if same cannot be maintained. It may be necessary to have a special wire ordered for this crossing. About 150 new poles are required on the section in making general repairs.

#### FORT CUSTER TO TERRY'S LANDING—FORT SISSETON TO WEBSTER—FORT TOTTEN TO LARIMORE.

Each of the above sections connects a military post with the nearest railroad office and is maintained solely for military purposes, except the line to Terry's Landing, which also provides an outlet for meteorological reports from Fort Custer. The sections are in good condition, and will require few repairs during next year.

#### FORT MEADE TO DEADWOOD.

This line has not been operated since February, owing to the fact that no operator could be had for Fort Meade. The post has telephonic communication, however, over a private line. Lieutenant Wright recommends that the line be again put in order, and equipped as a telephone line. Repairs to be made by troops at Fort Meade

[Extract from Lieutenant Wright's report.]

"It is deemed advisable if an officer is still to remain in charge of this division that he should go himself with the general repair parties every year when they start out in the fall. He should personally inspect every pole, bracket and insulator, and make every test possible to insure the lines being in perfect working order before cold weather sets in. When the lines are put in thorough order this way they will remain so, and, unless from unforeseen accidents, will require but little repairing during the winter."

Following were the line receipts in the Northwestern Division during the year:

Receipts for this line.....	\$3,468 41
Receipts for other lines.....	4,563 33

#### THE SEA-COAST TELEGRAPH AND TELEPHONE LINES.

The operation of the sea-coast telegraph lines built by this service on the coasts of New Jersey, Delaware, Maryland, Virginia, and North Carolina, has been maintained with as much efficiency as the very limited appropriation would permit. In addition to the telegraph lines operated by enlisted men of the Signal Corps, a number of telephone lines, aggregating 120 miles in length, are maintained by this service jointly with the Life-Saving Service, which connect the chain of life-saving stations between Sandy Hook, N. J., and Barnegat, N. J., between Atlantic City and Brigantine Beach, N. J., and between Cape Henry, Va., and Kitty Hawk, N. C. As in the past, this system of lines has proved of great value to maritime and commercial interests, both as a means of supplying meteorological reports from the entire coast between Sandy Hook, N. J., and Cape Fear, N. C., and for obtaining early assistance to vessels in distress. Passing vessels are communicated with by means of the international code of signals, and the fact of their arrival made known hours in advance of reaching port.

The total length of sea-coast telegraph and telephone lines is now 618 miles. Leased lines connect them with this office and with the signal stations at Philadelphia and Baltimore. During the year a telephone line 9 miles long, including 5,700 yards of submarine cable, was constructed between Atlantic City and the north end of Brigantine Beach, N. J. A new submarine cable, 1½ miles in length, was laid across Great Egg Harbor Inlet, N. J., the old cable after eleven years' service having entirely worn out.

The cables at Block Island, Barnegat Inlet, Hatteras Inlet, and Heady's Bay were also in bad condition at the beginning of the year and the Ocracoke Inlet cable had entirely given out. The Barnegat cable failed entirely during July, but as the small appropriation prevented the purchase of new cables or the making of extensive repairs to the land lines, nothing more than ordinary repairs could be accomplished except replacing the Great Egg Harbor cable before mentioned.

#### GENERAL REPAIRS NEEDED.

Between Sandy Hook and Barnegat Inlet about 20 miles of new poles and 300 insulators are required to put the line in thorough repair. From Little Egg Harbor to Atlantic City the line needs 3 miles of new poles, and from Atlantic City to Cape May 10 miles of new poles and 300 insulators.

Between Delaware Breakwater and Chincoteague and between Norfolk and Hatteras a number of poles need resetting, and some 700 insulators should be replaced.

Between Hatteras and Fort Macon about 7 miles of line should be rebuilt, and all iron poles, except 7 galvanized ones, replaced by new ones. The ungalvanized poles on this section have all rusted out. New wire is required, and a new cable,  $3\frac{1}{2}$  miles long, for Ocracoke Inlet, together with about 400 insulators and brackets. The Hatteras Inlet cable also requires repairs.

Between Macon and Sloop Point 69 miles of new wire are needed, 45 miles of new poles between Macon and Wilmington, also 500 insulators, and 1,000 yards new cable for Heady's Bay.

#### ESTIMATED EXPENSES OF GENERAL AND ORDINARY REPAIRS.

Amount needed for ordinary repairs, &c .....	\$2,988 00
General repairs between Hatteras and Macon.....	350 00
Cost of Ocracoke cable.....	2,772 00
General repairs between Macon and Sloop Point.....	345 00
Total.....	6,455 00

As the available appropriation is but \$5,500, it is recommended that the line be put in thorough repair between Macon and Smithville, and that the purchase of the Ocracoke cable, and the repairs to the Hatteras cable and to the line between Hatteras and Fort Macon be deferred until a more liberal appropriation is made for the sea-coast lines. The line between Hatteras and Macon is of no special value to the service, except as affording direct communication with the stations south of Hatteras, which during the past year has been replaced by communication via Western Union wires to Wilmington, N. C., without serious disadvantages.

#### BLOCK ISLAND CABLE.

This cable,  $11\frac{1}{2}$  miles long, and connecting Block Island with Point Judith, thence by land line to the transfer office at Narragansett Pier, R. I., is in very bad condition, and will probably not last another winter. Congress, however, failed to make appropriation for a new cable during last session, and nothing can be done should the old one become useless.

#### NANTUCKET CABLE.

An appropriation of \$40,000 was asked for, to establish telegraphic connection by submarine cables and land lines between Nantucket, via Martha's Vineyard, and to the mainland.

Only \$20,000 was appropriated, which makes it necessary to change the route first proposed. I recommend the cable be now laid from Point Gammon, on the mainland, or from some point near it, direct to Nantucket Village, a distance of about 21 miles. The bay is widest there, consequently the tides least strong; the bottom is hard sand, and the cable will lie flat and soon bury itself. An objection to this route is that it crosses the bay where vessels are in the habit of anchoring, and there is danger of the cable being fouled by anchors.

The total cost of laying the cable from Nantucket to the mainland, at 44 cents per yard, would be about \$17,000.

The other routes are objectionable on account of the strong currents and uneven bottoms.

This would allow \$3,000 for building the land-line connections and equipping the offices.

If the appropriation is expended in this manner, only half of the intended telegraphic facilities is obtained, leaving Martha's Vineyard still unprovided for, although in doing so the law is complied with.

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

SIGNAL OFFICE,  
Washington, August 27, 1884.

## APPENDIX 6.

### REPORT OF THE OFFICER IN CHARGE OF THE METEOROLOGICAL OBSERVATORY, WITH REPORT OF PROF. THOMAS RUSSELL.

METEOROLOGICAL OBSERVATORY, SIGNAL OFFICE,  
August 20, 1884.

To the CHIEF SIGNAL OFFICER, U. S. A.,  
Washington, D. C. :

SIR: I have the honor to submit the following report for the year ending June 30, 1884:

During the past fiscal year nearly all of the self-recording instruments have been thoroughly overhauled, and many defects, especially the trouble heretofore experienced in keeping the clocks running uniformly, have been remedied. To insure absolute uniformity on the time scales in the chronograph barrels small lines are made tri-daily on the record sheets, all corresponding to a certain time on the mean-time clock. This procedure became necessary because the faulty construction of some of the instruments makes it impossible to regulate the clocks so as to cause them to turn the chronograph barrels with regularity.

The continuous barometric curves taken from some of the best self-recording barometers have been made use of by Mr. H. M. Paul in showing the remarkable phenomenon of atmospheric waves which followed the explosive eruption of Krakatoa during last August. This subject having been treated at length by Mr. Paul (see his paper in the American Meteorological Journal, May, 1884) only tracings of the most remarkable curves immediately following the eruption are herewith appended. These tracings extend over a period of 48 hours, namely, from 12 noon, August 27, to noon August 29. The waves shown thereon have been attributed to the Krakatoa explosion, although similar waves are to be found very frequently on records months and years before the explosion, and consequently it is doubtful whether these curves on August 27 and 28 can be said to be due to the eruption. The tracings are taken from Gibbon's self-recording barometer, in which an iron float rests on the mercury in the short arm of the siphon tube. This float is suspended from the short arm of a lever whose long arm carries a thin platinum plate adjusted between two platinum points. Contact with either of which will, by the electric current thus completed, carry up or down by mechanical action a frame carrying the pencils which record on chronograph barrels.

Occasionally, especially in winter, the records of one or more self-recording instruments are lost through the fault of the batteries, and for this reason special care should be exercised by the party having the batteries in charge. As long as the battery gives out during the day the trouble can be remedied very quickly, but unfortunately the trouble generally is in the night.

At present this room is engaged in preparing a catalogue containing drawings and descriptions of all meteorological instruments in possession of the service, but on account of the varied and complicated drawings which have to be made before an intelligent description of the instruments can be given, the progress made so far has been necessarily very slight, and I would earnestly recommend that one or two expert draughtsmen be employed to make the required drawings, or that photographs of the instruments be taken to enable this room to finish this part of the work assigned to it.

It having been found that barometer corrections had been arbitrarily changed, scales shifted, &c., upon the evidence of inspectors' barometers which were sometimes in error, steps were taken during the year to remedy this trouble. Faulty barometers were at once called in and replaced by carefully compared ones, and it is hoped that in three or four months each station will be in possession of two reliable barometers. To avoid the serious deterioration caused by rough handling, a new barometer box has been devised with glass plates on the back so arranged as to obviate this difficulty by fastening the barometer permanently and yet in such a manner as to facilitate readings. These boxes have been sent thus far only to a few stations. It is strongly recommended that as rapidly as possible the interchange of boxes be accomplished.

One thousand and sixty instruments were carefully compared during the year: 622 were purchased by the purchasing and disbursing officer, 110 manufactured, a pair in the machine shop of the office, and 1,091 instruments were returned stations either broken or for repair. Of the 1,060 instruments compared 604 were used to regular Signal Service stations; 233 to private parties, 121 to cotton-beltions, 60 to the Louisiana State weather service.

I am, sir, very respectfully, your obedient servant,

THOMAS M. WOODRUFF,  
*First Lieutenant Fifth Infantry, Acting Signal Officer and Assistant*

SIGNAL OFFICE, WASHINGTON CITY,  
August 18, 1880

General W. B. HAZEN,  
*Chief Signal Officer, U. S. A.:*

SIR: I have the honor to make the following report of the work done by me during the last year:

The verification and comparison of all thermometers with standards have been my charge before being sent to stations; also the comparison of inspectors' barometers with standards before being sent out, and the intercomparison of standard thermometers.

The office has not had, until recently, any standard thermometers for temperatures below  $+32^{\circ}$  F. During the year a standard has been established for low temperatures by very careful and repeated comparisons of two fine Baudin thermometers, Nos. 9704 and 9705, with the air thermometer from  $-38^{\circ}$  F. to  $+32^{\circ}$  F. The result shows that the calibration agrees very well with the air thermometer. The greatest difference is  $0.4^{\circ}$  F., and increases gradually from  $+32^{\circ}$  F. to the lowest point,  $-70^{\circ}$  F. The air thermometer reads higher than the mercurial below  $+32^{\circ}$  F. It is a singular circumstance that the mercurial thermometer is trustworthy down to the very verge of the freezing point of mercury.

For temperatures below  $-38^{\circ}$  F., and down to  $-70^{\circ}$  F., two minimum stem-galvanometer thermometers of ordinary form were selected as standards, Nos. 867 and 918, and compared with the air thermometer. These thermometers, Nos. 867 and 918, have been compared with the thermometers that were used in the Arctic regions by Lieutenants Ray and Greely.

Liquefied nitrous-oxide gas was used in the production of these very low temperatures. The thermometers to be compared were put in alcohol, in a tin pail having a capacity of about one half gallon. This was then put in another tin pail a little larger, and the nitrous oxide allowed to flow around the vessel containing the alcohol. The alcohol was first lowered in temperature to about  $0^{\circ}$  F. by putting it in glass flasks surrounded with salt and ice. One gallon of liquid nitrous oxide suffices, in this way, for cooling off one gallon of alcohol from about  $0^{\circ}$  F. to  $-70^{\circ}$  F.

For comparing the thermometers from  $-38^{\circ}$  F. to  $+32^{\circ}$  F. mixtures of muriatic acid and ice have been used. To get such low temperatures the acid is cooled down by salt and ice to  $-4^{\circ}$  F. and mixed with finely chipped ice or snow. This method is very unsatisfactory. Besides the labor of chipping ice and the trouble of handling acid the mixture does not give at first a uniform temperature in all its parts. It has to be very thoroughly stirred for a quarter of an hour before readings can be made.

At low temperatures the Signal Service minimum thermometers are found to be greatly in error. Almost uniformly they read about four degrees lower than the true temperature at  $-40^{\circ}$  F. Often, however, the errors are much greater than this, the thermometer reading as much as 6 and 8 degrees too low.

At the very low temperature,  $-56^{\circ}$  F., one thermometer was found to read 12 degrees too low. The mercurial thermometers are not so bad. For the most part, as low as  $-35^{\circ}$  F., they do not differ by more than 1 degree from the true temperature, some reading lower and others higher than the true temperature. Occasionally, however, one is found that is out as much as 3 degrees.

The reason for these differences is that the makers do not point the thermometers at low temperatures. The thermometers have been pointed at  $32^{\circ}$ ,  $52^{\circ}$ ,  $72^{\circ}$ , and  $92^{\circ}$ , and the graduation continued uniformly above  $92^{\circ}$  and below  $32^{\circ}$  down to  $-40^{\circ}$  without any further reference points. In the case of mercurial thermometers, unless the bore is perfectly uniform and like that above  $32^{\circ}$ , the differences from true temperature may become very great at the low temperatures.

The differences are even greater with alcohol thermometers. The maker causes the degrees to diminish gradually in size, going down the scale according to some law for the expansion of alcohol that has been determined by experiment with probably very pure specimens of alcohol. The alcohol that is put in the thermometers may not be of the same purity, and so have a different law of expansion.

STAs record,

FORM NO. 102.











Then to this uncertainty is added that due to irregularity of the bore as in the case of mercurial thermometers.

It would be a somewhat difficult matter for makers to point thermometers at very low temperatures, but the determination of their corrections at these points is very simple. Now, however, Mr. Green points thermometers made for the Signal Service at  $+12^{\circ}$  and  $-8^{\circ}$  F. and also at  $+112^{\circ}$ . The graduations are continued above and below these points, as they were previously above  $92^{\circ}$  and below  $32^{\circ}$ .

All thermometers of the Signal Service on stations are now being called in, and compared from at least  $-28^{\circ}$  to  $+112^{\circ}$ . For stations in the northwest, comparisons of minimum thermometers are being made much lower.

As no corrections have heretofore been used, for these thermometers, below  $32^{\circ}$  (except in a few isolated cases where the corrections were known at  $+12^{\circ}$ ), the temperatures recorded in very cold weather have not been accurate. Indeed, it may be said that the minimum temperatures in the vicinity of  $-40^{\circ}$  F. are probably on the average too low by about  $4^{\circ}$  F.

When all thermometers have been compared, the back records of temperature can then be corrected if at any time in the future it should seem to be a matter of importance to have this done.

A series of comparisons of the air-thermometers has also been made with two mercurial thermometers every  $5^{\circ}$  C. from  $+25^{\circ}$  C. to  $+55^{\circ}$  C., to supplement a similar series of comparisons made at Baltimore in 1882.

All this work is being put together in shape for publication. When completed it will comprise calibrations of thermometers, tests of various pressures on bulbs of thermometers as affecting their readings, determinations of boiling points and fundamental distances on thermometers, comparisons with air-thermometers at low and high temperatures, agreement of the results with standard thermometers compared at the International Bureau of Weights and Measures, France, and at Kew, England, list of corrections of all Signal Service thermometers.

A careful series of comparisons was made during the year between six new Fuess barometers, Nos. 132, 141, 150, 152, 177, and 178, and Adie, Nos. 1526, 1555, and Green's "Standard, 1879." Three of the Fuess barometers have certificates of corrections as found by comparisons with the standard at the Central Physical Observatory, St. Petersburg.

The results of the comparisons show that the standard at St. Petersburg is 0.014 lower than the Kew standard as given by Adie, Nos. 1526 and 1555.

The Kew corrections of the Adie barometers are still retained as heretofore in determining the corrections of station and inspectors' barometers.

Very respectfully submitted.

T. RUSSELL,  
*Junior Professor Signal Service.*

## APPENDIX 7.

### REPORT OF OFFICER IN CHARGE OF PUBLICATIONS DIVISION.

PUBLICATIONS DIVISION, SIGNAL OFFICE,  
Washington, July 28, 1884.

To the CHIEF SIGNAL OFFICER OF THE ARMY:

SIR: I have the honor to submit the following report relative to the Publications Division for the fiscal year ending June 30, 1884.

The work of organization, which at the close of my last report had not been fully carried into operation, was completed early in the year and the division has been since running in such a manner as to fully prove the special advantages of the combination of the drafting, printing, and distributing rooms under a common division.

The following is a brief summary of the work performed during the year in the

#### DRAFTING-ROOM.

Maps reduced .....	760
Maps transferred to stone .....	552
Forms transferred to stone .....	25
Miscellaneous drawings .....	473
Maps backed and mounted .....	27
Maps examined when printed .....	302, 927

Maps designed and constructed: Northwestern Alaska, Mercator's projection; United States, Lorgna's equal surface projection; Canada, Lorgna's equal surface projection; Atlantic Ocean, Lorgna's equal surface projection.

Two draftsmen have also entered data and drawn isobars and isotherms on 366 daily, 12 monthly mean international, and 24 monthly review charts. The work of this room has been materially increased, and a higher standard of perfection has undoubtedly been reached, as can be readily observed by an examination of specimens of the work and a comparison with that of preceding years.

In the printing-room the following is a synopsis of the printing and lithographing performed during the year:

Daily bulletin of international observations .....	193, 208
Monthly summary and review of international meteorology .....	7, 370
Monthly weather review .....	30, 700
Farmers' bulletins .....	157, 125
Professional papers .....	6, 000
Signal Service notes .....	12, 000
History of the service .....	10, 000
Tornado circulars .....	100, 875
General orders .....	70, 850
Special orders .....	28, 130
Signal Service instructions .....	22, 850
Signal Service circulars .....	19, 100
Post-office wrappers .....	2, 579, 500
Envelopes .....	558, 650
Forms .....	282, 366
Letters .....	6, 850
Letter-heads .....	11, 500
Miscellaneous .....	84, 916
There have also been lithographed:	
Base maps .....	370, 253
Morning maps, 7 a. m. ....	92, 303
International charts, daily .....	206, 787
Monthly weather-review charts .....	96, 160
Letter-heads .....	49, 980
Forms .....	73, 260
Miscellaneous .....	53, 830

In this subdivision there has also been decided improvement. While the quantity of work performed does not materially differ from that of last year, there has been marked improvement in its quality, especially in the lithograph charts, which will now compare very favorably with those of foreign bureaus and other organizations for meteorological purposes. This improvement is due in part to the superior work furnished by the drafting-room as well as to the selection and assignment of competent employees to duties in the printing-room, for which they are specially adapted. The printing-room is now in better condition than ever heretofore, and though there is still room for improvement, yet it is respectfully submitted that the character of the work done, the proportionate amount per man, and the prompt and workmanlike manner in which it is handled and executed will bear comparison (especially in view of limited facilities, old methods and appliances) with those of the ordinary printing-offices of the country.

In the distributing rooms the work has been materially increased. In this connection it must be remembered that numerous publications are printed for the division by the Public Printer, and that the distribution of these in addition to the regular publications at this office entails on this subdivision a large amount of clerical and other labor, such as folding, wrapping, mailing, &c. The records of the division contain about 2,000 addresses of regular correspondents and co-operators, including both domestic and foreign, to whom publications are furnished regularly. Besides these there is a large class of casual recipients selected from the numerous miscellaneous applicants, apparently steadily increasing, for special publications, to whom such copies are judiciously issued as may be available from time to time. Efforts have also been made with a view to the improvement of this subdivision. A different system of records has been devised which is soon to go into operation, and which it is believed will be more effective and better suited to the requirements of the division. The retained publications, the accumulations of past years, have been in part examined and rearranged in chronological order, as far as possible, with a view to future convenience in reference, and this branch of the work is to be continued as time and opportunity permit. Prompt attention has been paid to the distribution of all publications, and earnest efforts made to issue them as early as possible. The compilation of a new and important publication has been begun during the year. The work is entitled "The Daily Meteorological Record," and is intended to take the place of the "Daily Bulletin of Synopsis, Indications, and Facts," the last volume of which was issued in December, 1877. The text of the record is printed by the Public Printer, as, owing to the limited facilities for printing and the large quantity of current work, it cannot be done at this office at present; the maps therefor are lithographed here. A division, known as the "Meteorological Record Division," has been established at this office, specially charged with the preparation of this work for publication. To the officer in charge I leave its description, as it is more appropriately his province. A complete edition has not yet been published, but the work is progressing both in the draughting and lithographing rooms as rapidly as the issue of current work will permit. The text is also being printed by the Public Printer, and the publication of the edition for the first month is expected at an early date.

The total number of employees in the division at the close of the year is 46, consisting of 31 enlisted men and 15 civilians, classed as follows:

Clerks .....	7
Draughtsman in charge .....	1
Draughtsmen .....	4
Printer in charge .....	1
Printers .....	15
Lithographers .....	4
Proof-reader .....	1
Pressman .....	1
Pressboys .....	6
Stitchers and folders .....	2
Engineers .....	1
Messengers .....	1
Laborers .....	2
<b>Total .....</b>	<b>46</b>

S. M. MILLS,

*Captain, Fifth Artillery, A. S. O., &c., in charge Publications Division.*

## APPENDIX 8.

### OPERATION AND ORGANIZATION OF STATE WEATHER SERVICES.

SIGNAL OFFICE, WASHINGTON, D. C.,  
September 8, 1884.

To the CHIEF SIGNAL OFFICER, U. S. A.,  
Washington, D. C.:

SIR: I have the honor to submit the following report relative to the operations and organization of local State weather services, co-operating with the Signal Service. These services were first organized in compliance with your request, as presented to the officials of the several States in your circular issued in 1881. The organization of these services has continued from year to year with gratifying results, and the benefits derived from such services cannot well be overestimated, as they not only aid the Signal Service in the collection of climatic data, but offer well-organized channels for the rapid distribution of storm and frost warnings which may be issued by the Signal Service. There are now in operation local services in the following-named States:

Missouri, under direction of Prof. F. E. Nipher, Saint Louis; Indiana, under direction of Purdue University, La Fayette; Iowa, under direction of Prof. G. Hinrichs, Iowa City; New Jersey, under direction of Mr. W. E. Cass, Newark; Tennessee, under direction of Hon. A. J. McWhirter, Nashville; Illinois, under direction of Mr. S. D. Fisher, Springfield; Ohio, under direction of Prof. T. C. Mendenhall, Columbus; Nebraska, under direction of Prof. S. R. Thompson, Lincoln; Michigan, under direction of Dr. H. B. Baker, Lansing; Alabama, under direction of Prof. P. H. Mell, jr., Auburn; Louisiana, under direction of Mr. E. S. Day, New Orleans; Georgia, under direction of Prof. L. H. Charbonnier, Athens; Mississippi, under direction of Prof. R. B. Fulton, Oxford; Kansas, under direction of Prof. J. T. Lovewell, Topeka.

During the year services have been organized in Louisiana, Alabama, Mississippi, and Georgia, and efforts are now being made to extend these organizations to Minnesota, North Carolina, and Pennsylvania, with hope of success.

A want of funds has prevented this service from supplying the necessary instruments to State services, and it is recommended that provisions be made in the appropriation of the coming year for sufficient funds for this purpose, as by this means State services could be organized in a number of States and the present State services could be perfected and made more valuable.

The inclosed report of my visit to the several States indicates the greatest interest taken in this subject by State authorities and those interested in the safety of crops liable to be lost by frost.

The State services should receive assistance from the local State governments and be organized by legislative enactment. This is the case in Ohio and Iowa, and when the people of the several States recognize the value of these channels of distribution of information to the agricultural districts other States will follow the example of those named.

The State service of Nebraska held a convention of its observers at Lincoln on February 11, 1884, and the Signal Service was represented at that convention by Sergt. A. Pollok, who gave full explanations of the work of the Signal Service and descriptions of meteorological instruments and manner of using them. Sergeant Pollok's paper is of general interest, and therefore forms a part of this report.

The local service of Louisiana has adopted the cold-wave signal as a frost signal, and complete arrangements have been made by the chief of that service to display this signal at all his stations, when warning may be given by the Signal Service of the approach of freezing weather.

The service in Alabama has also adopted the cold-wave signal, and arrangements have been made with the railroads in Alabama to carry the information of approach of cold waves in that section.

The Alabama service has, in addition to the observations and monthly bulletins, a system of weather signals, covering the greater portion of the State, the weather forecasts being made by this service and telegraphed each day to the chief of that

service, who distributes the forecasts by means of flags, indicating the character of the weather expected.

A meteorological society has been formed in New England, the work of which is somewhat similar to the work of the State services, and excellent results are anticipated from the monthly bulletins which have been promised from that organization.

As an evidence of the work performed by the local services, I submit the monthly summaries made up from the State bulletins for July, 1884.

I am, very respectfully, your obedient servant,

H. H. C. DUNWOODY,  
*First Lieutenant, Fourth Artillery, A. S. O. and Asst.*

The following is a list of inclosures:

1. Report of Lieutenant Dunwoody to the Chief Signal Officer on the efforts made to extend or organize local State weather services.
2. Lieutenant Dunwoody's remarks at the meeting of the Wisconsin State grange at Madison, December 13, 1883.
3. Extract from the Louisville Courier-Journal, December 20, 1883.
4. Extract from the Statesman, Austin, Tex., January 9, 1884.
5. Extract from the Gazette, Little Rock, Ark., January 13, 1884.
6. Letter of Hon. P. Dunn, M. C., published in the Little Rock Gazette.
7. Extract from the Times-Democrat, New Orleans, La., January 16, 1884.
8. Extract from the Daily Picayune, New Orleans, La., January 17, 1884.
9. Circular letter of Professor Mell, published in the Advertiser.
10. Extract from the World, Nashville, Tenn., February 1, 1884.
11. Extract from the State Journal, Lincoln, Nebr., February 12, 1884.
12. Remarks of Sergeant Pollok, at the convention of the Nebraska State weather observers at Lincoln.
13. Circular letter issued by the Indiana weather service, March 10, 1884.
14. Circular issued by the Louisiana weather service, April 27, 1884.
15. Extract from Sunday States, New Orleans, La., May 18, 1884.
16. Circular letter of Prof. W. W. Payne, Northfield, Minn.
17. Circular explaining the weather signals of the Alabama weather service.
18. Circular of the New England Meteorological Society.
19. Cold-wave circular issued by the Chief Signal Officer.
20. Frost and cold wave circular issued by the Louisiana State weather service.
21. Extract from the State weather service reports as published in the Monthly Weather Review for July, 1884.
22. Circular addressed to legislators and others by the chief of the Alabama State weather service.
23. Copy of bill establishing a meteorological bureau for the State of Ohio.

# I.

WASHINGTON, D. C.,  
March 31, 1884.

To the CHIEF SIGNAL OFFICER, U. S. A.,  
*Washington, D. C. :*

SIR: I have the honor to report that in compliance with letter of instructions dated November 30, 1883, I visited the following points for the purpose of either extending or organizing local State weather services, to co-operate with the Signal Service in the collection and distribution of meteorological reports. I left this city on the 9th of December last and went direct to Chicago, where I made a general inspection of the meteorological station. I found the station in charge of Private E. P. Callaway, with Private P. M. Hutchinson as assistant, Sergeant Norrington being absent on an inspection tour. He was authorized to make inspection of railway bulletin stations if said inspection could be made without expense to the Signal Service.

With a view of learning what efforts were being made to extend the usefulness of this service in Chicago I called for the station record book, and was informed that the assistants knew nothing of the books of the office, and that neither had any knowledge of such a book being kept at that station.

The assistants were intelligent and fully competent to perform the usual duties required at stations, but neither assistant was looking forward to the service as a vocation, or expecting promotion for efficiency or fidelity in his work. They both hoped to find something more profitable to do and apparently were waiting for an opportunity to leave the Signal Service and did not appear to be satisfied. They knew scarcely anything about the board of trade. I took Private Callaway with me to the board of trade and called on the meteorological committee. The president of this committee

said that he took much interest in the service, but he had not received the Weather Review for some months, and he supposed it had been discontinued.

I found the indications, farmer's bulletin, not posted in the frame, but lying on a shelf, white side up, and it had been used as pencil paper by some member of the board in calculating results of some transaction. My general impression was that there was an excellent field for Signal-Service work in the city, and that but little was being done to advance the interests of the service.

The assistants knew very little about the general work of the office, and complained that the sergeant kept them almost entirely in ignorance of such work, and they were only required certain duties. I judge that they must be correct from the inability of the assistant in charge to give information on many points. Neither of the assistants could tell where the sergeant resided.

I called on Mr. Stilwell to arrange for the display of the cold-wave signal from the tower of the Northwestern Depot in the city, and made arrangements for the display of the signal by the watchman of the building. The arrangement was completed after my return from Saint Paul, a few days later.

After completing these arrangements I visited Madison, Wis., calling upon the governor of the State and Professor Holden, of Washburn Observatory, who was much interested in the establishment of a State weather service in Wisconsin. I conferred with Professor Henry, of the Agricultural College, and arranged to address the State grange which was in session at the capitol building at the time of my visit.

I was presented to this body by Governor Rusk, and explained the efforts which were being made by the Chief Signal Officer to aid the farmers of the country in communicating information which the Signal Service collected. I gave an outline of the State service organizations, and explained to them the efforts which the service had made to warn them last September of the frost which injured the tobacco crop. I told them that on September 7 the Chief Signal Officer sent a message to Madison telling them of the approach of the frost on September 8 and 9, and that the message did not go out of the Madison telegraph office, owing to a want of proper organization. The governor at this point of my remarks stated to the grange that he could confirm what I had said relative to the dispatch, and that the Signal Service had given the forty-eight hours' notice of this frost which, if it had been properly distributed, would have saved the farmers in this vicinity thousands of dollars.

The grange passed a resolution directing that all possible aid be given to organize a State weather service.

Since my return I have written to Professor Holden suggesting that while we are waiting for instruments, it would be well to start the flag signals similar to those proposed in Indiana, and I hope by this means to attract much attention to the Signal-Service work, and in this way secure a permanent organization of the State service.

I next visited Prof. W. W. Payne, at Northfield, Minn., and found him in charge of astronomy and mathematics at the Carleton College. He is a competent, enthusiastic scientist, and well qualified to perform the duties of chief of State weather service, and with a supply of instruments he would be able to do excellent work in Minnesota. He gives time to a number of railroads and acknowledges the aid which he has received in this work from the Chief Signal Officer. The college is in a flourishing condition, and the local station, under charge of Professor Payne and one of the students of the college, is well located, and records are properly kept. Professor Payne states that he would use all the influence of the college and his personal influence to secure the appropriation for instruments necessary to organize the State service.

Upon my return I visited the station at Saint Paul in charge of Sergeant Lyons, who is a faithful and competent man and was anxious to have a full inspection of his station made, as it was his first station. He stated that his barometer needed cleaning, but as I had no barometer I did not consider it safe to undertake this work. He also states that the work and hours at that station required an assistant and wished that I would so state to the Chief Signal Officer. As to the work, I presume it is greater than at Springfield, Ill., but the hours are nearly the same, and I had no complaint from Sergeant Jennings, although at the latter station I observed that the sergeant was much confined. I think it quite confining for men in the Mississippi Valley to be in charge of stations without an assistant, although there are many business men not so well paid who have more hours of duty.

After leaving Saint Paul I returned to Chicago and completed arrangements for the display of the cold-wave signals at the Northwestern Depot in that city. The legislature of Kentucky was to meet on the 2d of January, and I therefore concluded it would be best to visit Frankfort before that date, and not wait until I had visited all other parties named in the order; so I went to Frankfort from Chicago, stopping at La Fayette, Ind., on the 16th, to confer with Mr. W. H. Ragan, chief of the State weather service of Indiana. I found the central station of the service well located, with the exception of the thermometer-shelter, which should have been ventilated, and this was noted by Mr. Ragan. This service was removed from Indianapolis at

the close of the last fiscal year, owing to failure of the legislature to appropriate funds for use of State offices.

I called upon the president of the college, Dr. Smart, and presented fully the plan for increasing the usefulness of the Indiana State weather service by adding railway signals, the college to be the distributing point of special indications sent to the State.

He expressed much interest in this plan, and stated that he would take immediate action to secure the signals for the two lines of railroad crossing the State, operated by the Louisville, New Albany and Chicago Railroad, provided I could secure the co-operation of the railroad in this matter.

I visited Louisville on the 18th and called upon the railway officials, who approved of the plan, and I so informed Mr. Ragan at La Fayette. I visited the signal station at Louisville, and the members of the meteorological committee. Found the station in good order; both Sergeant Dey and Assistant Curtis were well spoken of by those with whom their business brought them in contact. I do not like the window shelter at this station, and am confident that it is affected by the temperature of the building and room. I met the proprietor of the Courier-Journal and explained the object of my visit, and he directed a special correspondent to call at my hotel, by appointment, and kindly published a very favorable article on the subject, copy of which is herewith.

I visited Frankfort, calling first on Mr. Went, who is the associate to the commissioner of education of the State, and the voluntary Signal Service observer at that point. He presented me to the governor, Proctor Knott, to whom I explained the general plan of State weather services, and he wished me to meet the new commissioner of agriculture, Mr. Johnson; also stating that Mr. Johnson could arrange to take charge of the work. I met Mr. Johnson, and also Mr. Proctor, state geologist of Kentucky, and gave them an outline of the proposed plan of work, and, later, sent Mr. Went a draft of what I thought necessary to secure a State law to give this matter a preliminary organization.

I left Frankfort on the 19th and went to Springfield via Saint Louis, going through the new office in the latter city, which had been moved to the Government building. I found this office in excellent condition, and the business was conducted in a satisfactory manner.

I think it probable that the location of the rain-gauge on the roof of this building will not secure proper records of rainfall and certainly not of snowfall; and at stations where abnormal air currents are formed, owing to high chimneys, mansard roofs, and irregular surfaces, I should recommend that the rain-gauge be placed at some open space as near as practicable to the office. For the purpose of securing a good location for a voluntary station near Saint Louis, I accompanied Senator MacGrath to the College of the Christian Brothers, which is located 5 miles west of the city hall on elevated ground; and excellent opportunity is now offered to not only secure a valuable series of observations, but, at the same time, to extend the knowledge of meteorology to the large class of students who attend this college. The college has since been designated as a voluntary station, and instruments ordered.

I called on Mr. S. D. Fisher, at the state-house in Springfield, on the 22d, and found him anxiously awaiting my arrival, as he is looking forward to the increase of the meteorological feature of his work. Mr. Fisher has utilized meteorological data more than any other man in the agricultural departments of States, by publishing in his monthly crop reports the actual and average of season and of monthly temperature and rainfall for the past six years, and he is desirous of extending the system of reports, which can be readily done if instruments are furnished. Mr. Fisher also stated that he would urge the Senators in Congress to look after the Signal-Service appropriation for instruments. The system of flag signals has also been proposed to Mr. Fisher for Illinois.

After leaving Springfield on the 23d, I visited my home at Fairfield, Iowa, remaining there until the evening of the 25th, when I left Fairfield for Topeka, Kans., at which point I met Professor Lovewell, in charge of the Kansas State weather service. Professor Lovewell has recently been appointed meteorologist to the State Board of Agriculture, and will doubtless have many opportunities to increase the Kansas State weather service during the year. He has ten rain-gauges and a necessary supply of blanks, but no thermometers. With these instruments he would be able to secure observers in almost every county of the State. Transportation to the western part of the State has been furnished by the Union Pacific Railroad, upon the request of the Chief Signal Officer to the general manager at Kansas City.

Professor Lovewell informed me of a certain circular, which had been issued by some one connected with the Signal Service, urging those to whom it was sent to use their influence against the Signal Service. I could not secure a copy of this circular, but think I shall yet be able to do so, when I shall submit it to the Chief Signal Officer. I visited Kansas City on the 27th for the purpose of looking after the above circular, and also to confer with Mr. Case, postmaster, relative to the establishment of



a cold-wave signal station at that point, and made the necessary arrangements for two signals, one at the post-office and one at the Union Depot.

On the 28th I left Kansas City for Texas, going via El Paso, and taking six days leave of absence to attend to some private business. I inspected the station at El Paso, Sergeant O'Dowd in charge, corrected the location of rain-gauges, so that each would have the same exposure, examined the station books and found them well kept and up to date. After securing a letter of introduction to the governor of Texas and other prominent citizens of Austin, I left El Paso for the last-named place on the 6th, and arrived at Austin on the 8th. Professor Brown, of the State University, was much interested in the work of a Texas State weather service, and introduced me to the professors of the university for the purpose of enabling me to fully explain the plan of work.

I called on Governor Ireland, and secured an interview with the editor of the Statesman, who published a very excellent article in his paper of the 9th. I will add that Texas is one of the most important States for the organization of a weather service, and much benefit may be derived from the warnings which the Signal Service can give and thus have properly distributed. I am in doubt, after visiting the State capital and seeing the incomplete condition of the university, whether this is the best point for the central station. It might be well to place it in Galveston and have the sergeant at that point aid in organizing it.

I arrived at Little Rock on the 12th, and inspected the station under charge of Sergeant Simons, who deserves credit for the manner in which he conducts the business of his office and his high standing in the community. He is a member of the staff of the State Medical College, and it is this branch of the State college that will assume charge of a State weather service as soon as instruments can be furnished. I visited the Cotton Exchange of Little Rock, and explained to the members the object of my visit, and they immediately drafted and passed a strong resolution urging the members of Congress to aid in this work by providing the necessary funds. I found a general disposition to favor the Signal Service and its work and a readiness to acknowledge the usefulness of its reports.

From Little Rock I went to New Orleans, where I arrived on the 16th; visited the signal office and addressed the sugar convention on the evening of that day. This convention, after hearing of the object of the Chief Signal Officer in organizing a State service in Louisiana, appointed a committee to meet committees from the Cotton Exchange, Sugar Exchange, and Produce Exchange at 2 o'clock, in the Cotton Exchange building, on the following day, to make the necessary arrangements to organize a State service without waiting for State or Congressional aid. I met the committee per engagement, and it was agreed that each of the organizations named should give the necessary amount to make up \$1,500, the amount required to establish this service. I have learned since that the whole amount of money has been appropriated and that the organization is in progress. The commissioner of agriculture of the State was to take charge of it until the State made an organization, but I have not yet learned what arrangement has been made as to the head of the State service.

I next visited Montgomery, calling on the governor of Alabama, and receiving from him letters to the commissioner of agriculture, Judge Betts, who was at the State college at Auburn. I called on Judge Betts, who referred me to Prof. P. H. Mell, jr., professor of chemistry at the State Agricultural College, as the proper person to take charge of this work. I found Professor Mell much pleased with the plan, and he has taken much interest in his work, having organized his State service so far as to be able to commence operations on April 1, proximo.

The accompanying papers contain a published letter from Professor Mell to the citizens of Alabama, which will exhibit the energy with which he has entered upon his duties.

I next called on Mr. Henderson, commissioner of agriculture of Georgia, who has taken some interest in the meteorological work of the State in connection with the agricultural reports. I found that while something might be done by having the service under the commissioner of agriculture, more might be accomplished by placing the State service at some college in the State, and therefore took advantage of Professor Mell's recommendation of Professor Charbonnier, at Athens, Ga. The Chief Signal Officer has recently received a letter from Professor Charbonnier, stating that he would undertake the establishment of a State service if furnished with the cotton reports and instruments, and I think it would be well to place the State service at Athens, if such could be done without offense to the commissioner of agriculture, and I think it can be.

I visited Nashville, Tenn., for the purpose of conferring with Hon. A. J. McWhirter, chief of the State weather service of Tennessee, but found that he was absent from Washington, having gone there chiefly in the interests of his State service. I inspected the signal office under Sergeant Jesunofsky. The cold-wave flag was up when I entered the city, and I heard many commendatory remarks as to the value of the Signal Service by citizens.

I left Nashville on the 21st for Louisville, when I called again upon the officials of the Louisville, New Albany and Chicago Railroad relative to train signals. The superintendent of the road informed me that he would be pleased to try the signals, and wished to obtain models or samples of the signals so that he could tell just how to place them on the cars. I so informed Mr. Ragan.

The inclosed clippings from newspapers contain articles published in every place which I visited during the trip.

I left Louisville on the 23d and arrived at this city on the 24th.

I am, very respectfully, your obedient servant,

H. H. C. DUNWOODY,

*First Lieutenant, Fourth Artillery, A. S. O. and Asst.*

## II.

MADISON, WIS., December 13, 1883.

At the meeting of the Wisconsin State Grange, Lieut. H. H. C. Dunwoody, of the Chief Signal Office, Washington, was introduced, and made a speech relative to establishing a State weather service in Wisconsin, such as has already been established in Indiana, Illinois, Nebraska, Kansas, Iowa, Ohio, and other States. He said that he visited Wisconsin in behalf of the Government, and that the plan of the service was to have a volunteer in each county of the State take daily observations of the weather, and at the end of each month transmit the result to a central station, to be located at the university. Here, from all the reports, a bulletin would be prepared, showing the rainfall of the month just passed, and this could be issued to the people of the State through the medium of the press. From a perusal of this farmers could form a pretty correct opinion as to the prospect of the yield to be expected, knowing whether the rainfall had been too light, just right, or too excessive—which would be valuable to them. Then, again, if such a scheme was introduced, there would be a ready means of distributing predictions as to weather furnished from Washington. The Government's motive was entirely unselfish and was only to aid the farmers, though indirectly the Government would be benefited in securing detailed statements of the weather from all the counties of the State. It was the intention of the Government to start the scheme, furnish the necessary implements, &c., and then leave the legislatures of the various States to relieve it as soon as possible. The speaker desired the farmers to consider the matter, and when the proper time arrived to use their influence on the legislature.

Professor Whitney, of Michigan, was called upon, and said that he thought the farmers of the country ought to be aided by the Government as much as commerce, and that he believed the weather-service scheme suggested to be a good one. To the patrons he desired to say that the present year had been the most successful in their history.

## III.

[*Courier-Journal, Louisville, Ky., December 20, 1883.*]

### STATE WEATHER SERVICES.

To perfect the Signal Service system, to extend its influences, to observe more accurately, and to report and publish more promptly and widely all atmospheric changes are certainly objects which should enlist the attention of our legislators and secure the support of public-spirited citizens.

The movement of most importance just now contemplates the establishing of State bureaus throughout the country, which will observe most carefully local climatic conditions, make these observations matters of record, report them to the chief, and thus, in connection with the observations of the Signal Service, do much to extend the benefits of that department and to advance the whole science of meteorology.

The expense of such an organization is light. The idea is to make the service voluntary, under the charge of a director appointed by the governor. In this State this work might be assigned to the commissioner of agriculture or some other officer of the State, and a clerk appointed to facilitate business. In each county there should be a volunteer observer, who would make a daily record and a monthly report. It would be desirable to have all the instruments used of uniform pattern, submitted to standard tests, in order to give full, positive, and comparative value to the records.

These instruments should include one maximum and minimum thermometer, one dew-point or other hygrometer and rain-gauge, which would cost probably \$15. The director at the capital would issue each month a review of the weather, which would be furnished to each observer and also given to the press.

In this manner it will be possible to accumulate in a short time such an array of facts, such trustworthy information, that weather forecasts will not be all guesses, but it will be possible, at least a little while in advance, to foretell tornadoes, frosts, and similar disasters, especially those of a local character. Over the territory between the Rocky Mountains and the Atlantic there are about ninety stations; necessarily they are far apart, and local atmospheric disturbances of an important character often escape notice. It would not be so had each State a well-organized weather bureau, such as we have described.

Some States have already entered on the work with most gratifying results. The complete success which is anticipated will only come when each State does its part. It should not be said of Kentucky that we have neglected a matter of such importance to the entire community, especially to the farmers. The next legislature should, we think, make the necessary appropriation, authorize the governor to make the appointments, and to establish this bureau on the proper basis.

#### IV.

(The Statesman, Austin, Tex., January 9, 1884.)

#### WEATHER SERVICE FOR STATES.

Lieut. H. H. C. Dunwoody, of the United States Army, is in the city, consulting with our State officers, the members of the University faculty, and other persons, in regard to the establishment of a weather service for the State, to act in conjunction with the United States Weather Bureau. No better time could have been selected to present this question for general consideration. Here is the legislature in session, the stockmen in council, and the land agents of the State in consultation, while leading men are here from every part of the State. At present the Federal Government has, between the Rocky Mountains and the Atlantic Ocean, somewhere in the neighborhood of a hundred Signal Service stations, from which are sent to Washington three daily meteorological observations, from which forecasts of the weather are made. These stations are necessarily at great distances from each other, and to make the system more complete it is proposed that each State have an independent weather service for the purpose of gathering and utilizing local climatic data. Through so complete a system the people of the entire country would in time become conversant with physical conditions of all portions of the country, and they would be guided thereby. In tornado seasons these observations would be invaluable as warnings, and in the winter season we would know in Texas when a norther was approaching days beforehand. It is suggested that State weather service be wholly voluntary, under the direction and superintendence of a director, appointed by the governor, or it might be made part of the duties of some already existing officer. The secretary of the board of education in this State might be empowered to look after the service. The observer in each county might be a volunteer, or the service might be imposed upon some county officer. In specifications proposed for the State bureaus it is submitted that the instruments used should be of uniform pattern, carefully tested before use by comparison with known standards, and should include at least one maximum and one minimum thermometer, one dew-point or other hygrometer, and rain-gauge, all of which, with a supply of blanks and stamped envelopes for one year, it is stated, need not cost more than \$15 per station. The director should be fully impressed with the importance of the work and should issue each month a "review of the weather," as obtained from the State observations; this review to be furnished to each county paper for publication and to each observer within ten days after the close of the month. Some of the States have already established services, which are sustained, as they should be, at public expense, and Texas should not hesitate to enact at the earliest day a measure of this sort. Iowa appropriates only \$1,000 to carry into full effect the provisions of its service. The magnitude of our State territory would make the service in Texas more expensive than in any other State, but this would be nothing when its benefits are considered. No State should hesitate to do her part towards making the service complete. Of course it is not expected the measure may be taken up by the legislature now in session for specific purposes, but at the next regular session a bill creating a State weather service should be formulated and adopted.

## V.

[The Gazette, Little Rock, Ark., January 13, 1884.]

**STATE WEATHER—A SIGNAL OFFICER IN THE CITY ORGANIZING A STATE SERVICE—A PLAN THAT WILL BE OF INCALCULABLE BENEFIT TO OUR PEOPLE—WHAT IS PROPOSED.**

Among the arrivals in the city yesterday was Lient. H. H. C. Dunwoody, of the Signal Service Department of the United States Army. In company with Sergt. W. U. Simons, signal officer at Little Rock, he called at the Gazette office yesterday, and explained the nature of his business to the frigid weather reporter. He desires to extend the weather service of the State to act in conjunction with the United States Weather Bureau. There is not a thinking man in Arkansas who does not realize the great value of a systematic dissemination of weather statistics and warnings, such as the Signal Service is now furnishing the whole country. It is one of the marvels of the age, and the agricultural portion of the population are rapidly learning that it is almost indispensable to them. The Government has at present about one hundred Signal Service stations between the Rocky Mountains and the Atlantic Ocean, each of which sends three daily meteorological observations to Washington, from which forecasts of the weather are made. The stations are necessarily distant from each other, and General Hazen, Chief Signal Officer, has inaugurated a new scheme to make the system more complete. This plan is to establish independent weather service in each State, to gather and utilize local climatic data. It has been established in several States, with observers in every county; and the new plan of General Hazen is meeting with great approval and hearty co-operation from every State in which it has been introduced.

By this plan the people become conversant with the physical conditions of every locality in the State, and will in time be guided thereby. In the tornado season the results of observations in temperature and humidity will be invaluable, as they will enable a correct forecast to be made. The approach of cold waves and changes of the weather will be announced in advance, and to the agriculturist of the State it will be a great blessing.

The railroads of the State will be used to carry weather signals on the trains, and express a willingness to do everything in their power, by way of carrying signals and sending messages, that will increase the efficiency of the service.

Lieutenant Dunwoody, in explaining the organization of this State bureau, said that the service may be wholly volunteer and under the charge of a director appointed by the governor, or it may be made a part of the duties of some officer now authorized by law, such as the superintendent of public instruction, the president of some State college, &c. The observer in each county may be a volunteer, or it may be made the duty of some county officer to make a daily record and a monthly report. Observations should be taken, if possible, in State, county, and municipal offices and institutions. The instruments will include one maximum and minimum thermometer, one dew-point or other hygrometer, and rain-gauge, all which, with a supply of blanks and stamped envelopes for one year, need not cost more than \$15, and which the Government will furnish. The director of the State service should issue a compact monthly review each month, to be furnished the State papers within ten days of the close of the month. Systems similar to this are now in operation in Missouri, Iowa, Ohio, Tennessee, Kansas, Illinois, Indiana and other States. In some the service is sustained at the expense of the State. In Arkansas we have not yet any provision by our legislature for such work, and the system will be volunteer. Lieutenant Dunwoody was in consultation with many of our leading citizens yesterday, and with the meteorological committee of the Cotton Exchange. He has not yet decided whom to place in charge of the inauguration of the work. He desires, if possible, to have the State director at Little Rock, which is centrally located, and was also in consultation with the medical department of the Arkansas Industrial University, yesterday, in regard to the matter. No State, and especially Arkansas, should be lukewarm in aiding this enterprise, and doing all in her power to perfect the weather service. There is no doubt but that the legislature, at its next session, will create some sort of a State bureau, and follow the lead of her sister States.

Professor Mendenhall, of the Ohio State University, chief of the service in that State, addressed the Ohio legislature, at their request, last year on the subject. A few of the points made by him are peculiarly appropriate and explanatory of the benefits to be derived. He said that the Weather Bureau of the United States is recognized for its efficiency by the whole world. The Signal Corps was the inception of the Weather Department and was utilized. Ninety per cent. of its predictions are true. Millions and millions of dollars are annually saved by the work of the Department. Our country is so large that the data are few, and observers in every county are to be secured. Referring to the Illinois report, he said there was corn famine in

Southern Illinois last year which was predicted some time before. The idea was to place the information before producers, so that they may know what effect may be expected from weather statistics obtained.

The result of his address was, that a bill establishing a weather service was passed by the legislature of Ohio.

Further information as to the results of Lieutenant Dunwoody's mission will be given to-morrow.

## VI.

[The Gazette, Little Rock. Ark.]

## CONGRESSMAN DUNN AIDING THE INCREASE OF STATE WEATHER SERVICE.

Lieutenant Dunwoody, of the United States Signal Service, was in our city a few days ago, it will be remembered, trying to arrange for an increase in our State weather service. The matter is of great importance to our State, and was heartily indorsed by all our leading citizens, resolutions to that effect being passed by the Little Rock Cotton and Produce Exchange. In this connection a letter received by Sheriff John G. Fletcher yesterday from Congressman Dunn will be read with interest:

HOUSE OF REPRESENTATIVES, UNITED STATES,  
Washington, D. C., January 18, 1884.

Hon. JOHN G. FLETCHER,

*President Cotton and Produce Exchange, Little Rock, Ark.:*

DEAR SIR: I have just received, through the secretary of the Little Rock Cotton and Produce Exchange, the resolution passed by that body at its meeting on the 12th of January, instant, favoring an increase of the number of reports of the United States Signal Service in the cotton-growing States, &c.

Fully concurring in the views expressed in said resolution, I have caused it to be referred to the Committee on Appropriations, and will take the pains to go in person before that committee and urge a liberal and sufficient appropriation to secure the objects sought. That service is measured by the appropriations made from year to year.

Very sincerely, yours, &c.,

POINDEXTER DUNN.

## VII.

[The Times-Democrat, New Orleans, January 16, 1884.]

## A STATE WEATHER BUREAU.

Lieut. H. H. C. Dunwoody, of the United States Signal Service, is now in this city for the purpose of arranging some plan for the improvement of our weather service. He has been visiting the Western and Southwestern States under the instructions of General Hazen, who is desirous of improving the Bureau over which he presides, and of making it more complete by securing a system of co-operation with weather bureaus in each of the States.

Lieutenant Dunwoody's mission, therefore, is to secure the organization of a special State signal service here. He has been very successful so far, and wherever he has been his suggestions have been accepted. It is not generally known that thorough and effective weather bureaus now exist in Kansas, Missouri, Illinois, Indiana, Ohio, Michigan, and Tennessee; that Wisconsin, Georgia, Arkansas, and Minnesota are preparing to act, while several other States have taken the matter under consideration.

It is scarcely necessary to show here of what great value it is to all interests, not only to the farmers, but to the merchants and others as well, to fully understand the weather; and nowhere is it more important than here in Louisiana. Many of our crops are particularly tender and easily affected by atmospheric changes. They need constant watching and protection. At the request of our sugar planters the Signal Service recently made extra arrangements for warning us of an approaching freeze—a warning worth thousands and hundreds of thousands of dollars. Anything that will improve this service, therefore, should be encouraged by us.

Mr. Dunwoody yesterday visited the Chamber of Commerce and the cotton, sugar, and produce exchanges, with this end in view. Committees of these bodies will be

appointed to confer with him regarding the adoption of some plan for raising the funds to equip and furnish a State weather bureau, to secure the needed instruments, &c. The expense will be very slight indeed, and the money can readily be raised here, only about \$600 being needed. After the bureau is once organized there are no running expenses whatever.

The plan pursued elsewhere, and it is the one that will probably be adopted here, is to secure some State officer to act as the head of the State weather bureau. The officer generally selected for this purpose is the commissioner of agriculture. If he is unable to act, this duty is given to some college or public institution. The head of this bureau then selects a number of sub-officers in all the important points in the State—in Louisiana there would be about forty needed—who report to him daily or monthly the condition of the weather. The chief gives, at the end of the month, in a succinct and condensed form, a weather report, which is furnished to the United States Signal Service, and to the press for publication. In this way a meteorological record is kept, and the United States officers are assisted in making their prognostications. The State officers also serve to distribute the weather probability reports through the country districts, and thus give the farmers more timely warning than now.

Lieutenant Dunwoody also proposes to establish here, if possible, the system of rain and frost signals in force in Ohio and some of the Western States. Flags bearing symbols, foretelling a frost or rain, warmer or colder weather, that is approaching, are attached to the cars, and thus every farmer in the country through which these trains go is warned of any meteorological change that will affect him.

It is to be hoped that our merchants and planters will join with the United States Signal Service in improving our facilities for obtaining a better knowledge of the weather and an improved service. It will be of inestimable benefit to every interest—mercantile and agricultural.

### VIII.

[The Daily Picayune, New Orleans, La., January 17, 1884.]



#### A STATE SIGNAL SERVICE.—LIEUTENANT DUNWOODY DESCRIBES THE SYSTEM WHICH IT IS PROPOSED TO ESTABLISH.—ORGANIZATION OF A COMMITTEE TO RAISE NECESSARY FUNDS.

A meeting was held yesterday afternoon in the Board room of the Cotton Exchange for the purpose of affording Lieut. H. H. C. Dunwoody, of the United States Signal Service, an opportunity to explain the details of the special State service it is proposed to organize.

There were present Messrs. McLean, Day, and Dobbins, of the meteorological committee of the Cotton Exchange; Messrs. Allen, Roman, and Brodnax, of the Produce Exchange; Messrs. Bush, Lombard, and Henry McCall, representing the sugar-planters' convention. Mr. Herrman, the signal officer at this point, accompanied Mr. Dunwoody.

A committee had also been appointed by the Sugar Exchange, but owing to a misapprehension as to the hour fixed for the conference, which was 1 o'clock, they were not present.

By request, Mr. Dunwoody gave a general description of the service it is proposed to establish. His remarks were substantially as follows:

The object of our meeting is to consult, and to ascertain some method of organizing what is termed a local or State weather service to collect meteorological reports, and to utilize them in the different enterprises in which you are interested. We have in the Signal Service, as you know, about 120 stations distributed over the United States, but at wide intervals. They are sufficient for the indication of storms, but not numerous enough to furnish the necessary information in regard to the conditions which affect crops. The rainfall in Louisiana may be large enough to determine the success of the crops, while insufficient in Alabama and Florida, or there may be a drought in Louisiana and Texas, and abundance of rain on the Atlantic coast. We wish to ascertain the exact conditions, and it is proposed to fill in the intervals between the regular meteorological stations by means of local observations taken voluntarily under the direction of local organizations, as the Cotton Exchange, Chamber of Commerce, or, as in some States, the commissioner of agriculture. He receives from the various stations, daily, weekly, or monthly, reports by mail as may be desirable. The Signal Bureau furnishes the necessary blanks, forms, &c. The first cost of the equipment of a station is about \$15. We will equip these stations from the Signal Service fund if a sufficient appropriation can be obtained from Congress. We have asked for it, but there is no certainty of receiving it. The importance of

this service in furnishing valuable information induces the Chief Signal Officer (General Hazen) to act in this matter and organize this service independent of the appropriation we have asked for. The local service has been established in ten States, and is likely to be organized in six or seven more.

I have visited Kentucky, Wisconsin, Arkansas, Texas, and propose going to Alabama, Georgia, and other States. After reaching New Orleans I concluded it would be to the advantage of the agricultural interests if this service could be organized under the direction of the commercial bodies in this city. There should be 40 or 50 stations in Louisiana, distributed throughout the cotton and sugar districts. The stations would furnish daily, weekly, or monthly reports by postal card in accordance with forms I will show you, and the reports could be tabulated here and given to the public for the benefit of trade. These stations, being located within telegraphic limits, will serve for points of distribution for the bulletins which we may send, giving information of approaching danger from frost. It is possible that the whole State may be covered, and the warning communicated within six or eight hours after the bulletin leaves Washington.

Under the present arrangement, telegrams designed to give warning of frost may reach only one or two points, while it should reach all the planters. It is also proposed to have the railroad trains carry signals visible by day or night, so that when the train passes through a threatened district displaying the cautionary signal the people in the vicinity will know what to expect. Frosts injurious to the sugar crop may not occur every year, but some years when they do come a great deal of loss might be avoided if the proper warning were given.

If the Signal Bureau gets the appropriation which has been asked for, the local service can be organized without outside aid. The expenses will consist of the employment of one clerk to superintend the clerical labor of tabulating and sending out reports, and the first cost of \$600 for instruments. One thousand dollars per annum would insure a service of 40 stations, which would be sufficient for Louisiana. There are only two men in the Signal Service here, and they could not perform this extra work in addition to their other duties.

To insure the stability of the special service, it would be well to make it a State organization. The meteorological bureau of Ohio is established by act of the legislature, and gets an appropriation of \$2,000 per annum. The reports are published monthly.

The service in Iowa is also organized under State law. In Missouri there is an excellent service under direction of Washington College.

Lieutenant Dunwoody furnished further information in response to questions from gentlemen present.

On motion of Mr. Day, Col. Louis Bush was called to the chair and a discussion took place on the subject of ways and means to carry Mr. Dunwoody's suggestions into practical effect.

Mr. Day moved that the chair appoint a committee to take the matter in charge, and to call upon the exchanges represented—as the Cotton Exchange, Produce Exchange, and Sugar Exchange—for an appropriation of \$500 each to organize the system.

The motion was adopted, and Messrs. Robert S. Day, Columbus H. Allen, and H. J. Roman appointed on the committee.

The committee was also requested to confer with Mr. W. H. Harris, State commissioner of agriculture and immigration, and ascertain if he would take charge of the bureau.

The thanks of the committee were tendered to Mr. Dunwoody, and the assemblage adjourned subject to call.

Lieutenant Dunwoody left for Montgomery yesterday evening. He has been twelve years connected with the Signal Service, to which he was assigned from the Fourth Artillery.

## IX.

### ALABAMA WEATHER SERVICE.

AUBURN, ALA., January 31, 1884.

EDITOR ADVERTISER: General Hazen, the Chief Signal Officer, has requested me to organize a State weather service for Alabama, similar to the ones now in operation in Tennessee, Ohio, Missouri, Iowa, and Kansas. In entering upon the work, I consider it well to speak of the importance of such a system to every one throughout the State, and request that you will publish these few lines for the benefit of your readers.

All trades and professions are more or less affected by the changes of the weather; and the study of the laws governing the circulation of the atmosphere with its attendant phenomena is becoming more and more interesting to every man and woman in the length and breadth of the land. In a circular issued by the signal officer more than a year since to the different governors of the States, the object of these State systems was strongly brought out in the following terse language:

"By the organic law relating to meteorological work, Congress contemplated a weather system that shall be as useful as possible to the whole United States. Experience, however, has shown that in many questions relating to agriculture and other interests more minute details are needed, such as can only be obtained by having at least one report from each county, and this extension of the work must, for the present, devolve upon the individual States. The object of a State weather service should be to observe and utilize every feature of the weather that affects the prosperity of the inhabitants of the State as to crops, health, life, &c., omitting, perhaps, only those few items already provided for by the General Government at Washington, such as general storm predictions.

"The State service is, therefore, essentially a plan for gathering and utilizing local climatic data, and eventually it will define precisely the localities most favorable or unfavorable to special crops, diseases, &c. The chief of the State service should be in such communication with the Chief Signal Officer of the Army that he may at any time receive from Washington, and rapidly disseminate throughout his State, any information of importance, such as predictions of frosts, tornadoes, floods, &c.

"Observations should be taken, if possible, at all State, county, and municipal offices and institutions, such as jails, asylums, hospitals, libraries, toll-gate keepers, surgeons, colleges and high schools, water-works, &c.

"The director should be fully impressed with the importance of the work, and should issue each month a review of the weather as obtained from State observations, this review to be furnished to each county paper for publication and to each observer within ten days after the close of the month."

I shall endeavor to carry out the intention of the signal officer as expressed in this circular. It is my wish to begin with at least twenty stations located in the most advantageous manner wherever the railroad and telegraph will permit of rapid communication. As soon as I can obtain the necessary instruments I will place an observer in each county of the State. For the present, the observers will have to be volunteers, until sufficient funds are placed in the hands of the director to compensate these workers. The expense of the station to the observer will only be the consumption of five minutes' time at each observation three times per day. All stationery will be furnished by the central office.

At the close of each month bulletins will be issued through the office of the Commissioner of Agriculture, copies of which will be distributed throughout the State.

I ask for a hearty co-operation on the part of the papers, and I trust that all the periodicals in every county in the State will give me a place in their columns for spreading broadcast the valuable data obtained from the State weather service.

P. H. MELL, JR.,  
*Director State Weather Service.*

## X.

[The World, Nashville, February 1, 1884.]

### OUR STATE WEATHER SERVICE.

#### *To the World:*

In the Atlanta Constitution of January 22 was printed the following conversation, which took place between one of its reporters and Lieutenant Dunwoody, of the Signal Service, who is endeavoring to work up an interest in the extension of the predictions of the Signal Service, so that they will be available to farmers everywhere soon after they are issued, and also endeavoring to organize State weather services to co-operate with the Signal Corps. He said to the reporter:

"I am here to see if a plan can be agreed upon for extending your State weather service."

"What is the outlook?"

"Well, I have visited the State agricultural bureau, and I find that Judge Henderson and Captain Redding have organized what may be called the nucleus of a weather service. With a sufficient appropriation to pay for the services of one man, and to purchase the necessary instruments, you can have a weather service here that will be of incalculable value. With observations and reports forwarded from every county, the weather office here will be enabled to publish a monthly report to accompany the crop report now published by the Department. You will see the im-



portance of this to farmers. The approach of cold waves and changes of the weather will be announced, and if the railroads show a willingness to carry weather signals the service can be made very thorough."

"You speak of observations in every county?"

"Yes, I mean volunteer observations; or the legislature could make it the duty of some county officer to make a daily record and monthly report. Such a system is calculated to give the people a meteorological education. The good results of a continuous record of atmospheric changes cannot be exaggerated, because there is not an industry in the country that would not derive some benefit from it."

"How are the signals used?"

"Flags of different colors, denoting cold waves, wet weather, storms, &c., are, under this system, carried by railway trains and hoisted on the court-houses of every county seat."

"Have you met with any encouragement here?"

"Yes; I am well satisfied with the prospect. From what I have heard I feel confident that your legislature will take the necessary steps to make your weather service complete."

In endeavoring to organize State weather services, Lieutenant Dunwoody is trying to fill a long-felt need. The stations of the Signal Service are hundreds of miles apart, and between them numberless meteorological phenomena occur, not unseen, but unrecorded, and are thus totally lost to science. If we are ever to solve the problem of the weather we must have its changes recorded as completely as possible, and the experience of the past teaches us that it will not be long before law and order will begin to appear. But to do this, we must have more stations. Between Memphis and Nashville there might be an area of exceedingly heavy rainfall, while the rainfall at both stations was light; or there might be a belt of destructive thunderstorms, which were scarcely felt at either station. Suppose the yield of a certain crop had been very heavy in the central part of the State. A searcher after the cause might look at the records of the Memphis and Nashville stations, and finding the rainfall comparatively light, conclude that a light rainfall was favorable to the growth of the crop, when the reverse was true. Then, would we know more about weather changes and crop production? Would we know which portion of the State is most favorable for certain crops? Would we know whether crops raised in other States could be favorably raised in this, without always having to spend time and money and probably several years in practical experiments to find out? Would we know more about the connection between the weather and the growth and decline of those lately so much talked of bacteria of disease?

To do this we must have a net-work of stations all over our State. Thanks to the kindness of General Hazen, and the good sense and energy of our Agricultural Commissioner, and his assistant, Major Bate, a good beginning has been made. Fifty thermometers and rain-gauges have been distributed to some of the sons and daughters of our State, who nobly give their time without pay to the great work. But the observers are as yet poorly equipped; they have no shelter to protect their instruments, nor all the necessary instruments, and, being unpaid, how can we expect them to stay at home to take observations when their business demands they should be away? Thus, in a great many instances, that accuracy and completeness of its records upon which almost the whole of its scientific value rests is lost. To bring the service to perfection the legislature must add the pecuniary assistance, and let us hope that it will. To what valuable results it would lead it is impossible to say, but I firmly believe that its utility to the public would expand with every year of its age. Perhaps it would be well to review some of the results that have already been obtained in other countries.

"Sir Rawson Rawson, after an elaborate investigation of the rainfall of Barbadoes, West Indies, proves not only a distant connection between the fall of rain and the total sugar product of the island, but also that it is possible beforehand to predict within narrow limits what the total yield of the season will be.

"In Lyons and Paris a system of rain-gauge stations has been organized at the head of the water-sheds; daily reports are sent to the central office, and so great is the experience gained by constant practice that no flood ever reaches either city until long after its advent has been announced, and usually the height predicted is realized within a few inches. It would probably be within the truth to say that the hydrological commission of Lyons and the Seine have saved to France tens of thousands of pounds."—Lecture by Prof. G. J. Symons, F. R. S.

There is no reason why this could not be done in Tennessee. Enough then is in full view to warrant the complete organization of our weather service, and unless our farmers, river men, and others dependent on the weather, see to it that the legislature at its next session make an appropriation for this purpose, it seems to me they must be blind to their own interest, and let us hope that the legislature through false ideas of economy will not deny the thousand or two necessary to the endeavor to save tens of thousands wasted to the State.

H. H. CLAYTON, JR.

## XI.

[State Journal, Lincoln, Nebr., February 12, 1884.]

THE WEATHER WISE.—THEY MEET IN CONVENTION AT THE UNIVERSITY.—SOME INTERESTING PAPERS AND PROFITABLE DISCUSSIONS.

The Convention of the State Weather Observers met at room 17 of the university, in pursuance of the call of Prof. S. R. Thompson, of the agricultural college. A fair number of gentlemen attended, and organized by the election of Mr. Alexander Pollok, observer Signal Service, U. S. A., at Omaha, as president, and Prof. G. D. Swezey as secretary. Professors Nicholson and Barber were present during part of the evening and participated actively in the discussions.

Observer Pollok read a lengthy paper on "Meteorological Instruments," which he accompanied by numerous illustrations on the blackboard, following it with an interesting description of the manner in which observations are recorded, transmitted, and enciphered in the Government department, and closing with remarks appreciative of the efforts of Professor Thompson for the improvement of the State weather service, which remarks were loudly applauded. Following the reading of this paper, came a running discussion upon the various topics touched, and more especially upon the method of best exposing rain gauges.

Professor Swezey next read an excellent treatise on the proper exposure of the thermometer, which elicited queries and remarks relating to this subject, and brought out several points of general interest. A debate upon the meteorology of Nebraska in the various phases ensued, among which tornadoes, gales, and storms were prominently mentioned. From the tenor of the meeting it was evident that the State weather service of Nebraska is a beneficial institution that should, as it could, be improved by the co-operation of the legislature. Nothing is more important to the farmers of this State than its meteorology as affecting the soil and climate, and the good work deserves to be encouraged by every means.

The Convention of State Weather Observers adjourned at 10 p. m. to meet again at the same place this morning at 8.30 a. m.

## XII.

OMAHA, NEBR., March 14, 1884.

To the CHIEF SIGNAL OFFICER, U. S. ARMY,  
Washington, D. C.

SIR: I have the honor to report, at this late day, that I attended the convention of the Nebraska State Weather Observers, in accordance with instructions from the office of the Chief Signal Officer. The meeting was not well attended, but from the interest evinced better results in the future may safely be expected. I was elected president of the convention in compliment, no doubt, to the Signal Service.

Inclosed herewith I submit transcript of a paper on "Meteorological Instruments," read by me before the convention.

I am, sir, very respectfully, your obedient servant,

ALEXANDER POLLOK,  
Sergeant Signal Corps, U. S. A.

## METEOROLOGICAL INSTRUMENTS.

*A paper read before the Nebraska State Weather Service Convention at Lincoln, Nebr., February 11, 1884, by Sergt. Alexander Pollok, Signal Corps, U. S. A.*

MR. PRESIDENT: It was my purpose when I accepted the invitation of Professor Thompson to read a paper on meteorology before this convention to select as my theme "The work of the Signal Service in Nebraska," but, on suggestion of Lieut. H. H. C. Dunwoody, assistant to General Hazen, whose efforts in behalf of State weather services and the popularization of our invaluable, because most practical, science cannot be too highly appreciated, I have partly modified my subject, and purpose to treat here more particularly on the method of taking observations correctly. For, remember, upon the accuracy of our reports depends the value of our individual labor, and upon the value of our aggregate labor the reliability of the total result. Take, for instance, the barometer. It is an instrument which measures the height of a column of mercury supported by the pressure of the atmosphere. From this height the weight of the atmosphere is ascertained. The construction of it is simple. Take a glass tube, about 3 feet in length, hermetically sealed at one end and open at the other; fill it with quicksilver, and then, closing the open end of the tube with the finger, invert the tube and immerse the lower end in a cup filled with mercury. On removing the finger the liquid will fall only a moderate distance, and will be maintained at an elevation of about 30 inches above the level of the liquid in the cup. The fluid is upheld in the tube by the air outside of it pressing on the mercury in the bowl; and

since the one thus balances the other, it is evident that the mercurial column will serve as an accurate indicator of the varying pressure of the air. It requires, therefore, only a graduated scale attached to the glass tube to record the height of the atmosphere—that is, the reading of the barometer—at any time. Of course, great care must be taken to expel both air and moisture from the tube and fill it with pure mercury in order to obtain the greatest perfection possible. Having thus constructed a barometer, it is necessary next to read it correctly. No broker weighs his precious metal with greater precision than the observer must employ in the recording of this instrument, nor is it necessary that he should. Not one-thousandth of an inch—aye, ten-thousandth sometimes—should escape the observer's eye, for the slightest deviation may impair the calculations based at the central office upon their report, defining the area of low and high pressure, and hence the movement and progress of storms, which may be the means of saving or losing life and property beyond estimate.

Do you now understand the importance of taking your observations with scrupulous care?

First of all, be punctual. Therein lies the unequaled advantage of the military system of the Signal Service, that it trains each man to be at his post of duty at the exact minute required—by day or night; fine weather or foul; in peace or war; in safety or danger; at isolated stations or populous cities; in a salubrious or plague-stricken country—always amenable to orders; always subject to Army discipline.

Granted, then, that you heed this first elementary rule, and be always promptly at your observatory, you next take the barometer out of the box, in which it should always be kept for safety and cleanliness, and read the attached thermometer on its side, quickly though carefully, before the different temperature of the room can affect it. Note the degrees in a book which you must carry habitually with you, wherein to record all readings as soon as they are made.

The object of reading the attached thermometer, as stated, is this: The mercury in the barometer tube, which is intended to record the height of the column of air-reading upon the cistern, will be affected more or less by the temperature prevailing about it; and to ascertain, therefore, how much of the rise or fall of the barometer is due entirely to the pressure of the atmosphere you must add or deduct, according as the attached thermometer is above or below 32° F. (which is the uniform temperature determined on for purposes of comparison), whatever expansion or contraction is owing to other causes, as in this instance, to temperature.

This done, tap the barrel of the barometer firmly, to free the mercury from the sides of the tube; then adjust, by means of a screw, the surface of the ivory point which is the zero of the scale. Be careful that the contact be a mere touch and no more. If the barometer has a sliding scale, bring the lower edges of the vernier to the column of mercury, as I show by this illustration, so they exactly coincide with the top of the meniscus or curvature of the column without cutting off any of the light of the angles. A vernier is an instrument for reading off the graduated scale of the barometer true to the one-hundredth or one-thousandth part of an inch. It consists of a piece similar to the scale of a barometer, along which it slides. It will be observed from the drawing on the blackboard that ten divisions of the vernier are exactly equal to eleven of the scale, that is, to eleven-tenths of an inch. Hence each division of the vernier is equal to a tenth of an inch, together with the tenth of a tenth, or a hundredth, or to ten hundredths and one-hundredth—that is, to eleven hundredths of an inch. Similarly, two divisions are equal to twenty-two hundredths of an inch, which, expressed as a decimal fraction, is 0.22 inch; three divisions of the vernier, 0.33 inch, &c. In reading the barometer, you first note the whole inches, then, continuing on the scale upwards, the tenths, and finally take the point at which a division of the scale and a division of the vernier lie in or the nearest to the same straight line, and thus obtain the hundredths.

Most every barometer has a slight error, due to imperfect construction, and this, as by careful comparison with a standard instrument may be determined, is either added to or deducted from the reading of the barometer, after correction for temperature has been applied according as it causes a higher or lower state of the mercury.

A barometer often used, because of its convenient size, is the aneroid. The principle on which this depends is the varying pressure of the atmosphere upon an elastic metallic chamber partially exhausted of its air, and so constructed that by a system of levers a motion is given to an index hand which moves upon a dial. Of course this kind of instrument is not implicitly reliable, but by frequent comparison with a mercurial barometer good results may be obtained.

In the Signal Service the instrument read next to the barometer is the anemometer, and following this the exposed thermometer; but I will explain the latter first as being of greater importance and in more general use.

There stands in Omaha in front of a popular cigar store an Indian, for whom the good people of that city manifest the tenderest solicitude. Every morning, especially in extreme cold weather, the passers-by stop and note carefully the temperature of the savage, which is denoted by a thermometer suspended from his neck. Now, I claim that this Indian, wooden man though he is, causes a great deal of mischief.

His temperature differs from that of the air by some 8 or 10 degrees; and yet the people insist upon consulting it as the standard authority of the weather for the city. Now, I maintain that this is a gross libel upon the climate of Nebraska, since it gives outsiders the impression that in summer it is unbearably hot and in winter correspondingly cold here, when the official records of the Signal Service show an entirely different condition. Now, you ask what is the trouble? Simply this: The thermometer hanging around the Indian's neck, however sensitively it may respond to the varying temperature of the dummy, is not a just indicator of the temperature of the air around it. Expose your thermometer in the open air, where the circulation is unobstructed. Let it face the north at some elevation from the ground and some distance from the wall or other object liable to reflect heat, and keep it invariably in the shade; or, in other words, do precisely the reverse of what the red man in the wilderness of Omaha is doing.

The thermometer, as is scarcely necessary to say here, consists of a small glass tube, having a bulb at one end and partially filled with mercury or spirit of wine. In constructing this instrument the mercury should be pure and dry, and boiled, so as to expel the air. The bore of the tube should be equal, so far as possible, throughout. As it is impossible, however, to obtain a glass tube perfectly cylindrical, it is necessary to graduate the scale by actual test, each degree to correspond with the other, not in distance, but in volume of mercury. Two variable temperatures are fixed by which the graduation of the scale is made. On Fahrenheit, which is the instrument used in this country, these fixed points are 32 and 212 degrees; that is the temperature at which ice melts and water boils, respectively.

To determine the greatest heat or greatest cold experienced during a day, self-registering thermometers are employed. The maximum thermometer used in the Signal Service is an instrument of the ordinary make, except that a depression in the lower end of the tube divides the column of mercury. The mercury of this detached column expands as the temperature rises, while the other end only retreats towards the bulb when the temperature declines. Hence the end of the detached column denotes the maximum temperature attained during the time since last set. By bringing the instrument to a vertical position, with the bulb downward, the detached portion descends nearly into contact with the remainder of the column. A speck of air admitted into the maximum thermometer may serve the same purpose as the depression mentioned.

To determine the minimum temperature a spirit thermometer is used in which is immersed a steel index. As the temperature falls the spirit draws the index with it, but when the spirit expands, that is, the temperature rises, it freely passes the index and leaves it lying at the lowest point to which it has been dragged, thus recording the greatest cold. This thermometer is set by bringing the index close up to the top of the spirit by raising the bulb end of the instrument.

The apparatus for testing the temperature of the water consists of a small thermometer inclosed in a cylindrical metallic case. A portion of the case is hinged so as to be swung open when it is desired to read the thermometer. A valve at the bottom of the case admits the water as it sinks to the bottom of the river, and falling into place when the case is drawn up prevents the water from escaping.

It is of great importance for the proper prediction of the weather to determine the amount of moisture in the air. Various methods have been devised for this purpose, but in accuracy and simplicity the wet bulb surpasses every other. This instrument is a common thermometer, having its bulb covered with a piece of muslin, and kept constantly moistened with water by means of wicking in communication with a cupful of rain-water. The muslin should be changed when covered with dust or other impurities. When the air is dry evaporation proceeds rapidly from the muslin, and on account of the heat lost by evaporation the wet bulb indicates a lower temperature than the exposed thermometer. But when the air is damp evaporation is slower, and the difference between the two becomes smaller; and when the air is completely saturated evaporation ceases, and the instruments show the same reading as the exposed thermometer, near which—about 1 foot apart—it should be exposed. Tables for the deduction of the dew point and the relative humidity of the air are furnished by the Chief Signal Officer, and are indispensable to every practical meteorologist. The determination of the dew point may be of great value to the horticulturist in indicating the approach of low temperature or frost, since it shows the point near which the descent of the temperature of the air during the night will be arrested. I am sorry that I cannot enter more fully into the explanation of this subject without imposing upon my time and your patience too much.

I made mention of the anemometer as being read by the observer of the Signal Service immediately following the barometer. The instrument used is the Robinson anemometer, consisting of four equal metallic cups in the form of hemispheres, attached to two arms, which cross each other at right angles, and are so supported as to turn freely about a vertical axis. The base of each hemispherical cup is in a vertical position; and since the action of the wind is upon the concave side of one of these cups greater than its action upon the convex side, a moderate breeze is sufficient to main-

tain the arms in continuous motion. Dr. Robinson has proven that the center of each hemisphere moves with one-third the velocity of the wind, and thus this instrument measures directly the velocity of the wind.

An electrical contrivance, by means of which the velocity of the wind so obtained is directly recorded upon a sheet divided into hours, part hours, and minutes, kept inside of the office, has been introduced by the Signal Service, which record is not only convenient and accurate, but continuous, and serves often in the determination of damage suits in courts besides its intended scientific purpose.

While mentioning this invention let me say that the Signal Service has added vastly to the stock of new and useful meteorological instruments, for which the most advanced nations have made handsome acknowledgments, although our own public, misled by roaring demagogues or deceived by chronic malcontents, is slower in its appreciation.

In the observation of the weather the clouds form not the least important element. It is necessary to observe not only the kind, which, for brevity, we will divide here into fibrous upper clouds, called cirrus, and layers of lower clouds, called stratus, besides the mountainous clouds often observed in the sky during warm weather, and the different subdivisions formed of a combination of either, as cirro-cumulus, cirro-stratus, cumulo-stratus, but also the direction from and the velocity with which they move. Fog is a cloud resting upon the earth. Any cloud from which rain falls is called nimbus.

Great stress should be laid upon the accurate measurement of the rainfall. We in Nebraska, who have heard so much discussion on this subject in connection with the fertility of our soil, realize fully its great importance. Expose your gauge, which consists of a cylindrical tube and a funnel, where it is free from all obstructions and oddies. This is not so easy as may appear at first thought, and great care should be exercised therewith. Insert the measuring stick into the cylinder and note the amount of water indicated thereon. Then reduce the amount so obtained according to the proportion of the tube to the area of the funnel. In the Signal Service this proportion is as ten to one, so that a rainfall of 1 inch collected by the funnel is equal to 0.1 inch in the tube. When the precipitation is in snow, take the cylinder of the rain-gauge, invert it and plunge it vertically into the level snow until it reaches either the ground or the upper surface of the snow that fell before the last measurement was made, dig away the surrounding snow, slip a sheet of tin under the lower end of the cylinder, lift it up and put the cylinder, open end upward, in a warm place, where the snow will quickly melt, then measure the depth of the water. The actual and not the relative depth of water in the cylinder will be recorded. Sleet or hail, when falling with rain, is measured as the latter, and like snow when falling with snow.

Other instruments could be named, but the foregoing are sufficient for all practical purposes when carefully and punctually noted.

All first-class stations in the Signal Service take three daily telegraphic observations, two local observations, and as many special observations as may be prescribed. At each of these observations the barometer is corrected for temperature and instrumental error, as mentioned in the outset, and also reduced to sea level. The latter is done for the purpose of readier comparison. To illustrate, take Lincoln and Pike's Peak for example. Say there is a perfect equality of air pressure between the two places; the column of air resting upon the base of the barometer cistern here will be much higher, and hence the pressure of it much greater, as the elevation of your city is less than that of Pike's Peak. Hence the barometer at Lincoln may read 30 inches, and only about 18 inches at the other point, while at the same level both would be perfectly alike. For this reason a neutral point, so to say, has been chosen to which all corrections are adapted, and the sea level is, of course, the most natural that suggested itself, being everywhere the same. Should, after this reduction is made, the barometer at Lincoln read 30 inches and only 18 inches at Pike's Peak, then you may conclude that the world is coming to an end, for such diversity, if it were possible, would indicate a commotion in the atmosphere utterly unprecedented. By this I mean to show once more the significance of high and low pressure, but more particularly the convenience of reducing all barometric readings to the same level. The difference, then, speaks for itself.

When a telegraphic observation is completed the data are translated into cipher, a transaction, by the way, perfected almost to a fine art, and transmitted thence by special wire to Washington. At the chief office draftsmen are ready at the appointed time to chart the isobars, isotherms, dew points, clouds, &c., upon separate maps, from which the officer in charge deduces the indications for the following day as you find them in the daily press.

From the same cipher, or as many of them as any station receives, are prepared the daily bulletins, three times a day, as you find them posted in all large cities where signal offices are located. Those who study these bulletins regularly know how to appreciate their value. I doubt whether there is ever a general storm of any magnitude that the Chief Signal Officer fails to predict, partially at least. A great deal of abuse has been heaped on the present management of the department for alleged in-

accuracies, when in truth and fact the percentage of verifications was never greater than at present. I believe it was 88 for 1883. You do not suppose that General Hazen attends in person to the preparation of the indications. To do that would require his presence mornings, noons, and nights, week-days and holidays, and in all eternity, to say nothing of the neglect in such cases of his vast administrative duties. The indications are prepared by officers who devote years of patient study to this particular branch of meteorological science and gain in proficiency in the ratio of their experience. Let this serve you as a sample of the insane criticism bestowed upon the service by persons who for the most part could not tell a barometer from a crowbar or an anemometer from a windmill.

If, nevertheless, the Signal Service is susceptible to further improvement, it is not because the Chief Signal Officer does not employ the means at his command to the best advantage, but because these means are not sufficient to cover the immense field deserving of cultivation. And what a field it is! When all along the lakes and sea-coast the flying storm-signals give warning to the mariners to keep in port, or when perhaps a tempest-tossed ship is sighted by a signal man on lonesome watch, who, by means of torch, or flag, or telegraph, summons the needed rescue, thus saving mayhap in one single night more than the whole appropriation for the Signal Corps amounts to, if, indeed, the value of human life, not to speak of the worth of the cargo, may be expressed in figures; when all this and more I say is done by the service, you never hear of it. It is treated as a matter of course. But if, perchance, once in a lifetime, a vessel be wrecked through the caprice of a local storm, the blame is forthwith attached where it does not belong—to this department.

Some day when the people of this country shall awake to a proper realization of their best interests, they will clamor, not as the croakers do for retrenchment, but for a liberal extension of the Signal Service, to include warnings of destructive storms, frosts, floods, &c., in the interior of the country in the manner now employed along the sea-coast. Already has General Hazen taken the initiatory steps for such a consummation, and if members of Congress were fully aware of the needs of their constituents they would not hesitate long to supply the sinews of war against the fiercest enemy of the husbandman and shipper, the hostile elements. It behooves not my position, perhaps, to utter these bold sentiments, but as I propose to cast my lot in another sphere of usefulness some early day, I can indulge in more freedom of speech than I otherwise would.

It may interest you to know that at the same moment that you step into your observatory to take one of your tri-daily readings prescribed, a thousand or more co-workers, distributed all over the northern hemisphere, and most of them eminent scientists, repair to the same work for precisely the same object. There is not a prominent observatory, college, station, or barracks anywhere in Algeria or Japan, in India or Siberia, not to speak of the more civilized countries of Europe, where regular observations, by voluntary contributors like yourselves, are not taken. There is not a ship in the British, Swedish, Spanish or American navy, whether cruising in the Arctic, middle, or equatorial zones, that is not instructed to take simultaneous meteorological observations. And the Chief Signal Office in Washington is the one great receptacle into which the whole mass of data flows and where the vast collection is computed, sifted, and prepared for practical and scientific deduction. Speak of the work of the United States Signal Service! There is not a government short of barbarism on the face of this planet that would not cheerfully adopt our system and give in exchange for it ten times the amount Congress stintingly appropriates for the same, had it but natural advantages and other facilities for its operation such as this great and glorious country enjoys.

Let it be a source of just gratification to you to be part of this useful and beneficial system, and thank Professor Thompson for his tireless efforts, in the face of constant discouragements, to secure to Nebraska the greatest share of blessings to be derived therefrom.

### XIII.

PURDUE UNIVERSITY.

OFFICE OF PRESIDENT,  
La Fayette, Ind., March 10, 1884.

*To school-teachers, superintendents, county and city officers :*

The Signal Service of the United States has been found to be of incalculable benefit to the maritime interests of the country. It is believed that it can be made of as much benefit to its agricultural interests. Timely information of the coming of a cold wave, for example, spread among the farmers of this State, would without doubt save many thousands of dollars' worth of farm products annually. I am reliably informed that a crop worth \$50,000 was lost in a certain county last fall, which might have been saved if the farmers had taken advantage of the weather report published in a certain daily paper in that county. The daily press is doing a valuable service by publishing weather indications.

The Signal Service of the United States is seeking additional means of disseminating information among the people. A scheme has been devised by means of which signals showing weather indications can be placed upon railroad trains. The management of the State weather service is negotiating with some of the railroads of the State with a view of placing these signals upon their lines. But these signals can be seen only when the train is passing, and hence must be observed at a given time, or not at all. We have devised another scheme, which has received the approval of the Signal Service Bureau at Washington, and which can be made to reach thousands of people which the railroad scheme will not reach. It is to furnish signal flags to any teacher, superintendent of schools, county or city officers, who will agree to run them up on a flagstaff. The commissioners of every county in the State would confer a great benefit on the farmers of their immediate vicinity if they would cause these signals to be run up on their court-houses. School trustees, superintendents, and teachers of schools in charge of school-houses, not in the immediate neighborhood of court-houses, would confer a like benefit by raising the signals upon their respective buildings.

There are two things necessary for the successful execution of this scheme. First, to procure the necessary information concerning the weather indications each morning; and, secondly, to procure and use the necessary signals. If the railroad signal scheme becomes general in the State, the necessary information can be obtained at any railroad telegraph office, or from any railroad train.

The necessary signal flags will be furnished by William H. Ragan, director of the State weather service, Purdue University, La Fayette, Ind., at cost. This will be \$2 per set for ordinary cloth, and \$3.50 per set for bunting.

The signal flags are very simple, and can be properly displayed by any one, and it will take but five minutes a day to set them. If properly elevated, they can be seen at a distance of half a mile or more, and can be readily interpreted. They will indicate six things:

1. Higher temperature.
2. Lower temperature.
3. Stationary temperature.
4. General rain or snow.
5. Clear or fair weather.
6. Local rain or snow.

Full printed directions for the use of these signals will accompany each set sent. Orders will be filled in the order of their reception.

The signals for this State will be based upon special daily information received from the Signal Service Bureau at Washington, and upon a special daily forecast of the weather for the State of Indiana. Arrangements have been made with the railroads, and towns along each road can secure information each morning at their railroad station.

WILLIAM H. RAGAN,  
*Director Indiana Weather Service.*

J. H. SMART, *President.*

#### XIV.

##### LOUISIANA STATE WEATHER SERVICE.

[Circular.]

NEW ORLEANS, LA., April 27, 1884.

SIR: Through the munificence of the bodies represented by the members of this committee we are enabled to establish a State volunteer weather service in Louisiana, in co-operation with the United States Signal Service. The benefits to be derived from this institution are manifest, as the data collected will be of immense importance hereafter in weather prognostications, and in forming opinions of the effect of weather on crops. It will also arrange for the rapid and complete distribution of frost warnings throughout the sugar region. It is our purpose to establish a station in your section, and to the end that we may obtain observers who will be thoroughly efficient we would ask you to recommend to us any person of your acquaintance who would probably volunteer and who would be reliable. The duties are not onerous. They consist of observations two or three times daily of the temperature, the condition of the atmosphere, the rainfall, and all incidental phenomena, a record of which is to be kept in a book furnished for that purpose, and weekly or monthly returns of the data to be made to us upon the blanks furnished.

The instruments furnished will be of Government construction and bought from them by us for the State weather service.

To any close observer of nature, or to one who is fond of collecting scientific data, the position of volunteer reporter will be one which will afford much pleasure.

The reports from all the stations will be embodied in a monthly report, in pamphlet

form, which will be distributed throughout the State for the benefit of planters and farmers.

Begging you to give us the benefit of your advice in regard to an observer near you at your earliest convenience,

Yours, truly,

ROBERT S. DAY,  
*Secretary.*

*Committee.*—Col. Louis Bush, of Bush & Levert, representing sugar planters' convention; John T. Brodnax, representing New Orleans Produce Exchange; John Barkley, of Barkley, Thomson & Co., representing New Orleans Sugar Exchange; Robert S. Day, of Gidiere, Day & Co., representing New Orleans Cotton Exchange.

## XV.

[Sunday States, New Orleans, La., May 18, 1884.]

### THE STATE WEATHER BUREAU.—AN INSIGHT INTO THE SYSTEM AND ITS INCALCULABLE RESULTS.

The joint committee, consisting of Col. Louis Bush, of the planters' convention; J. T. Brodnax, of the Produce Exchange; John Barkley, of the Sugar Exchange, and Robert S. Day, of the Cotton Exchange, have issued their first report of the Louisiana State weather service.

Some months ago the movement was inaugurated by the subscription of \$1,500 from the commercial bodies represented, but the sum subscribed was exhausted in the purchase of instruments. They propose to establish stations all over the State, from which to receive regular observations and data, and again to utilize every train leaving the city to carry signals of approaching frost or storms, by displaying on them flags in the day time and lanterns at night, so that all the people along the lines of railway can, in the critical period of crops, receive due warning of changes in the weather from 24 to 48 hours ahead, and thus be able to make due preparations to save their crops from frost. The regular stations to be established by June 1 will furnish data which in two or three years will be a basis of predictions of seasons for all the sections of the State. Time has proved the correctness of such predictions, and all needed is to start the service to furnish the needed data. In addition to the trains carrying these signals, on receipt of such warning, each station will hoist a frost or storm flag or lantern.

The joint committee expect the legislature of Louisiana, as other States have done, to make an appropriation of at least \$2,000 to further and aid the enterprise.

An instance of the value of this service is recorded in the State of Wisconsin. Last year Lieutenant Dunwoody, of the Signal Service, sent a warning dispatch to Madison, Wis., predicting frost in 24 or 48 hours.

The State had no bureau, and no way to disseminate the news. The telegram lay unnoticed in the office at Madison, Wis., and the result was that the unexpected frost in 48 hours had ruined the tobacco crop of the entire State; while, had it been heralded to the planters, there would have been ample time to gather and protect the crops, whose loss amounted to \$1,500,000. With this service established in Louisiana, telegrams of warnings could be sent to every planting section of the State, and the benefit derived from the knowledge that a frost would come in even 24 hours would much more than compensate for the small outlay, as no one in the service will be salaried, except the clerk compiling the monthly reports and sending the predictions.

The following States have adopted or are adopting this system, namely: Ohio, Missouri, Tennessee, Alabama, Mississippi, and Kansas. The United States, which will be a large beneficiary from the establishment of these State services in the way of minute data, will always aid and foster the enterprise.

The following table from the June report is of interest, as it contains the records of frosts from 1870 to 1884:

Year.	First frost.	Last frost.
1870-71	Dec. 20, 1870	Jan. 15, 1871
1871-72	Dec. 1, 1871	Feb. 2, 1872
1872-73	Nov. 30, 1872	Jan. 19, 1873
1873-74	Nov. 20, 1873	Jan. 30, 1874
1874-75	Nov. 26, 1874	Feb. 10, 1875
1875-76	Dec. 13, 1875	Feb. 16, 1876
1876-77	Nov. 21, 1876	Feb. 13, 1877
1877-78	Nov. 11, 1877	Jan. 25, 1878
1878-79	Nov. 1, 1878	Feb. 11, 1879
1879-80	Nov. 20, 1879	Feb. 27, 1880
1880-81	Nov. 16, 1880	Apr. 2, 1881
1881-82	Nov. 24, 1881	Feb. 5, 1882
1882-83	Nov. 30, 1882	Jan. 23, 1883
1883-84	Dec. 16, 1883	Feb. 15, 1884



## XVI.

## STATE WEATHER SERVICE.

CARLETON COLLEGE OBSERVATORY,  
Northfield, Minn., August 12, 1884.

DEAR SIR: Gen. W. B. Hazen, Chief Signal Officer, Washington, D. C., has recently addressed an important communication to the director of the observatory at Carleton College, Northfield, in regard to organizing a State weather service for Minnesota. In that letter he says:

"It is my purpose to establish local State services in the several States, which will aid the Signal Service in collecting meteorological data, and at the same time afford a well-organized system of stations, which will enable the Signal Service to distribute the information which may be collected to the best advantage; or, in other words, I hope by the co-operation of the State services and the Signal Service to make the latter more valuable to the people of the country."

The plan of the State service is to have a central State office and a State director, and at least one voluntary observer in each county, who will keep a record of temperature and rainfall, and report the same to the central office of the State, at such times and in such ways as the Chief Signal Officer at Washington shall plan for or request.

County observers wishing to make continuous records of wind force, humidity, and the barometer, will be aided in all possible ways, both by the State and the Government service; for such observations are locally of equal value to those of temperature and rainfall.

The State director will supply from the chief officer at Washington the instruments necessary for all the observations spoken of above at greatly reduced cost from catalogue prices. These instruments will be compared with the Government standards at the Chief Signal Office, and a memorandum of errors of all will be furnished to each local observer, so that a uniform system of observations is secured for the weather service of the entire country.

The central State office will also furnish, free of charge, to all local stations, the necessary blanks, instructions, monthly weather review, reports of the State weather service, and all other useful information communicated by the Chief Signal Officer at Washington for that purpose.

Attention is asked to the following advantages of a State weather service:

1. It will bring the benefits of the signal service of the United States into every county of Minnesota participating in the State service.

2. It will be the means of soon securing better predictions of weather changes and storms, so much needed in the Northwest.

3. It will soon prepare Minnesota for a system of storm signals displayed from railway trains that will be widely beneficial to agricultural interests.

4. It will give to every county the Government standards for temperature, rainfall, wind-velocity, humidity, &c., which are sources of useful public information.

5. It will put within reach of local agricultural societies means of accurate observations which, in the course of years, must be valuable to any locality in the study and adaptation of cereals.

6. It will bring the science and methods of the national signal service within the reach of the principal high-schools of the State, offering teachers and pupils alike excellent opportunities to study a wide range of the application of science to foster and protect agricultural industry.

7. For about \$15 the instruments for temperature and rainfall can be secured.

To take the observations requires but little time daily, and the exercise is especially agreeable to those that are interested in natural science. Any person so disposed will probably not find it difficult to raise the necessary means to buy all instruments wanted for a complete station at the county seat of each county, for various interests are to be served, and, in all probability, liberal people who naturally have interest in useful science will cheerfully contribute for such an enterprise.

Instruments necessary for observations desired by the State service and the Signal Service of the United States:

Thermometer:	Cost.
External .....	\$2 50
Maximum registering .....	5 00
Minimum registering .....	4 00
Rain-gauge, copper, iron overflow .....	1 25
Measuring stick .....	25
Total .....	13 00

Very truly, yours,

W. W. PAYNE, *Director.*

## XVII.

## ALABAMA WEATHER SERVICE. EXPLANATION OF SIGNALS FOR INDICATING CHANGES OF THE WEATHER AND CONDITIONS OF TEMPERATURE.
















[Please post in a conspicuous place.]

At an early hour each morning these signals will be raised simultaneously at all telegraph stations throughout the State. The predictions will be furnished the director each day by the Chief Signal Officer at Washington, and these predictions will be immediately telegraphed from Auburn to the superintendents of the various railways, who will promptly distribute the warnings along their several lines.

The upper flags will always designate the approach of rain or fair weather, while the lower flags will always refer to the changes of temperature.

The flags must be so placed on the staff as not to permit of their becoming entangled during a calm.

The following are the possible combinations:

	Fair weather and lower temperature.
	Fair weather.
	Higher temperature.
	Fair weather.
	Stationary temperature.
	Local rains and higher temperature.
	Local rains.
	Stationary temperature.
	Local rains.
	Lower temperature.
	General rains and stationary temperature.
	General rains.
	Lower temperature.
	General rains.
	Higher temperature.

P. H. MELL, JR.,  
Director, Alabama Weather Service.

AGRICULTURAL AND MECHANICAL COLLEGE,  
Auburn, Ala., August 15, 1884.

## XVIII.

## NEW ENGLAND METEOROLOGICAL SOCIETY.

The New England Meteorological Society was formed in Boston, in June, 1884, to promote the extension and diffusion of knowledge relating to the atmospheric phenomena of New England. It aims to awaken an interest in meteorology among the people; to lead the meteorological workers in New England to conduct their observations according to a common plan; and to discuss and publish the results obtained.

All persons interested in this work, whether they can undertake regular observations or not, are invited to apply for membership in the society by sending their names and addresses to the secretary, stating at the same time their occupations and whether they have hitherto made a practice of keeping records of the weather. Members have the right of attendance at the meetings of the society and will receive its publications free. The regular meetings will be held at places yet to be named, on the third Tuesdays of October, January, and April. The fee for membership is \$3 a year.

The council of the society proposes to begin its work by undertaking to collect statistics of rainfall and range of temperature. A circular will be issued to members at a later date explaining the details of the plan of observation, with information as to the cost of the required instruments, which will be moderate. It is desired that observations should be made at numerous stations in all parts of New England, and to promote this end the council may, when advisable, secure the services of persons not members of the society. Regular observations will be begun as soon as practicable, and thereafter a monthly bulletin will be issued containing a summary of the observations collected.

It will be an aid to the society if those who receive this circular will bring it to the attention of such of their friends as are interested in the study of the weather. It is hoped that no one will fail to apply for membership, or to undertake observations simply on account of inexperience in meteorological work; the observations proposed are such as can easily be taken without more instruction than will be contained in the circulars to observers, and the time that they require will be short.

Applications for membership and communications relating to the society should be made to

W. M. DAVIS,  
*Secretary, Cambridge, Mass.*

Correspondence concerning matters of observation should be addressed to  
PROF. WINSLOW UPTON,  
*Director, Providence, R. I.*

## XVIIIa.

## RAILWAY WEATHER SIGNALS.

## DAY SIGNALS.



BLUE SUN.

General rain or snow.



RED SUN.

Higher temperature.



BLUE STAR.

Local rain or snow.



RED STAR.

Stationary temperature.



BLUE MOON.

Clear or fair weather.



RED MOON.

Lower temperature.

These signals are now in use on railroads in Ohio, Pennsylvania, and Canada.

Prof. T. C. Mendenhall, chief of the Ohio meteorological bureau, first placed this system of signals in practical operation, and he reports that citizens living on the lines of roads carrying these signals have received substantial benefits from the information they have thus obtained from this office. The signals consist of sheet-iron disks about 3 feet in diameter, and are displayed on the side of baggage-cars.

The Chief Signal Officer has prepared at Washington each night a special weather forecast for the region of the roads named, and this is telegraphed to the superintendent of each road soon after midnight, so that the morning trains may display the proper symbols to indicate the probable weather and temperature of the coming day.

It must be remembered that these predictions indicate only the *probabilities*, and that no one can foretell the character of the weather for twenty-four hours with absolute certainty. It is believed, however, from past experience, that in a great majority of cases the predictions will be verified.

The signal will consist of two figures which differ in color, being red or blue, and in form, being shaped like the sun, a crescent, or a star. The red color refers to the temperature and the blue to the state of the weather, as rainfall or snow. They are used as below:

By "higher" or "lower" temperature is meant that the temperature at any hour of the day may be expected to be higher or lower than it was at the same hour the previous day, and by "stationary" temperature that it will not vary more than  $3^{\circ}$  or  $4^{\circ}$  from the record of the previous day.

Local rains are such as are likely to occur at one or more points along the line, but will not probably be general. Local rains are not generally of long duration.

## NIGHT SIGNALS FOR RAILWAY STATIONS.



One green star—fair weather.



Two green stars, fired in succession, with interval of one minute—local rain or snow.



Three green stars, fired in succession, with intervals of one minute—general rain or snow.



One red star—lower temperature.



Two red stars, fired in succession, with interval of one minute—stationary temperature.



Three red stars, fired in succession, with intervals of one minute—higher temperature.

These signals were successfully used at the grange exposition at Williams Grove, Pennsylvania, August 26 to 29, 1864.

They are in the form of rockets or an exploding cartridge, which, when fired, may be seen from 6 to 10 miles. It is proposed to supply these signals to points in agricultural districts and have them fired at a stated hour during the night to indicate the probable weather for the coming day.

## XIX.

CIRCULAR.—PUBLISHED BY CO-OPERATION OF THE WAR AND POST-OFFICE DEPARTMENTS.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, ———, 188—

SIR: The Chief Signal Officer is desirous of increasing the usefulness of the Signal Service reports in your section. The information collected by the Signal Service, by means of the daily telegraphic reports, renders it possible for this office to announce the approach of sudden changes in temperature.

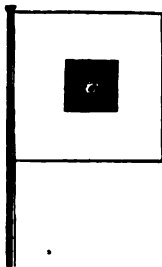
There is scarcely an industry which would not be greatly benefited by warning of the approach of cold waves, and especially is this true of those interested in agriculture and stock farming.

Not possessing the necessary funds to convey this information by telegraph to the various sections of the country, the next best means has been adopted, viz, to publish the information in the Farmers' Bulletin, as follows:

## COLD WAVE COMING.

*Cold-wave flag has been ordered up at —, and the temperature will probably fall — in the next 24 hours.*

The country has been divided into districts, and *cold-wave* stations established at central points; when cold weather is anticipated, the *cold-wave* flag (white flag, six or eight feet square, with black center, about two feet square) will be ordered up at the central station and the information published in the Farmers' Bulletin. These bulletins are displayed at post-offices, and it is believed that a much wider distribution of the information thus given may be secured by the display of *cold-wave* flags at the various post-offices where the bulletin may be received.



The Signal Service is not prepared to supply these flags for general use, but a flag such as is described above will not cost more than \$1, and there may be parties residing in the vicinity of your office willing to co-operate in this work by furnishing the flag and displaying it at some prominent point for the benefit of the public. It is believed that much benefit will result from prompt action on the part of those who may be charged with the display of these flags, and probably some arrangement may be made with the railroad companies, along whose lines stations may be located, to assure the transmission by telegraph of the order for the *cold-wave* signals before the receipt of the Farmers' Bulletin.

The cold-wave flag is displayed only when the warning is given in the Farmers' Bulletin, or by telegraph, and it should be taken down at the expiration of twenty-four hours, unless a second warning is published. Please present this circular to those of your neighbors who may be interested in this subject.

I am, very respectfully, your obedient servant,

W. B. HAZEN,  
Brig. and Bvt. Maj. Gen'l, Chief Signal Officer, U. S. A.

XX.

[Circular.]

## LOUISIANA STATE WEATHER SERVICE.—FROST WARNINGS.

In co-operation with the United States Signal Service, we have undertaken the transmission of cold-wave signals throughout the State, particularly in the sugar districts. The information gathered by the bureau enables them to announce cold waves at least twenty-four hours in advance of their reaching Louisiana, which will be of great advantage to the planters and farmers.

Through the kindness of the officers of the various railroad and telegraph lines throughout the State, we are enabled to announce that signals will be displayed at the points mentioned in appended list. We name also the place where the flag will be displayed.

The signals are: When a *cold wave, with possible frost, is coming, a white flag with black square center*. When a *frost is positively expected, a plain white flag*.

We urge the planters in the vicinity of each station to co-operate with us by associating themselves with a view to distributing rapidly the news in their section. We are prepared to furnish large flags to such associations at about \$2 each, which can be seen at great distances.

Steamboats or steamers leaving the city when frost is expected will be asked to display the signal, as will also the trains on the various railroads.

Stations.	Signal displayed by—	Stations.	Signal displayed by—
New Orleans.....	The custom-house and the exchange.	Jeannerette .....	Colonel Whitworth.
Kenner .....	Agent Mississippi Valley Railroad, through the kindness of J. M. Edwards, vice-president.	Morgan City .....	Dr. J. P. H. Wise.
Saint Peters .....	do	New Iberia .....	Lee's Drug Store.
Convent .....	do	Opelousas .....	Chas. N. Kaler, esq.
Saint Gabriel .....	do	Thibodaux .....	S. T. Grisamore, esq.
Baton Rouge .....	Major J. S. Jones, State University.	Vermillionville .....	Messrs. M. P. Young & Co.
Port Eads .....	Capt. W. L. Wright, through the kindness Ocean Telegraph Company.	Whyteville .....	J. R. Hunter, esq.
Point-a-la-Hache.....	F. Meyers, esq., through the kindness Ocean Telegraph Company.	Baldwin .....	Agent Mississippi, Louisiana and Texas Railroad, through the kindness of J. G. Schriever, vice-president.
Davis.....	Agent Texas and Pacific Railroad, through the kindness of Superintendent Cummings.	Bayou Sale .....	Do.
Saint John .....	do	Boutte .....	Do.
Saint James .....	do	Broussardville .....	Do.
Achnel .....	do	Carenoro .....	Do.
Baton Rouge Junction.....	do	Chacaboula .....	Do.
Gros Tete .....	do	Eola .....	Do.
Maringouin .....	do	Grand Coteau .....	Do.
Fordoches .....	do	Pattersonville .....	Do.
Melville .....	do	Raceland .....	Do.
Goahan .....	do	Saint Martinville .....	Do.
Morrows .....	do	Sorrel .....	Do.
Bunkil .....	do	Terrebonne .....	Do.
Cheneyville .....	do	Tigerville .....	Do.
Lecompte .....	do	Washington .....	Do.
Mooreland .....	do	Monroe .....	E. M. Coe, esq.
Donaldsonville .....	Dr. J. D. Hanson	Lake Providence .....	V. M. Purdy, esq.
Plaquemine .....	Messrs. Roth & McWilliams.	Delta .....	Dr. S. S. P. Dangerfield.
Bayou Sara .....	John F. Irvine, esq.	Saint Joseph .....	W. M. Davidson, esq.
Alexandria .....	Dr. Henry St. John	Vidalia .....	W. T. Evans, esq.
Cheneyville .....	Dr. J. R. Keator	Shreveport .....	U. S. Signal Office.
Franklin .....	Dr. A. S. Gates	Minden .....	W. S. Hunter, esq.
		Manafield .....	S. B. Foster, esq.
		Coushatta .....	L. M. Howard, esq.
		Natchitoches .....	S. B. Jones, esq.
		Lake Charles .....	Dr. Knapp.
		Clinton .....	Thos. Sadler, esq.
		Amite City .....	W. H. Tegarden, esq.
		Red River Landing .....	Dr. W. A. Martin.
		Houma .....	E. Gouaux, esq.
		Mandeville .....	Hon. Alex. Bend.

If any points in the sugar belt, other than those in the above list, can be reached by telegraph, we will be glad to establish stations at such places.

Information will be furnished and every assistance given to planters, &c., by the State weather service.

LOUIS BUSH.

*President.*

ROBERT S. DAY,

*Secretary, P. O. Box 983, New Orleans, La.*

## XXI.

### *Reports of State Weather Services, July, 1884.*

#### ALABAMA.

AUBURN, ALA., August 1, 1884.

Although there have been oppressive and sultry days, the month of July has sustained quite a uniform temperature, and the nights have generally been cool and comfortable. The heat in some sections, however, has been keenly felt, because the atmosphere was so saturated with moisture as to prevent rapid evaporation from the body. The thermometer ranged as high as 100° at only four stations.

The State has been visited by copious showers, and in some sections the rains have been unusually heavy. The farming interests, however, have suffered but little, and the prospects for a fine crop are very flattering.

*State summary.*—Mean temperature, 80°·5; highest temperature, 104° at Troy, on the 25th; lowest temperature, 54° at Selma, on the 8th; range of temperature for the State, 50°; greatest monthly ranges at stations, 35° at Troy and 41° at Calera; least monthly range of temperature, 14° at La Fayette and 25° at Auburn; greatest daily

ranges at stations, 38° at Calera, 35° at Selma, on the 8th and 27° at Gadsden on the 21st; least daily ranges, 0° at Union Springs on the 10th, 0° at Florence on the 15th, 0° at Carrollton on the 28th, and 9° at Mobile on the 23d.

Mean depth of rainfall, 5.47 inches; mean daily rainfall, 0.186 inch; largest monthly rainfall, 12.02 at Green Springs; least monthly rainfall, 0.41 at Fort Deposit; greatest daily average for the State, 1.10 inches on the 28th; largest daily rainfall at stations, 3.50 inches at Carrollton, 3.10 at Scottsborough, and 3.50 inches at Wetumpka, all on the 28th.

Days of general rainfall, 14th, 15th, 25th to 29th; average number of days on which rain fell, 11; average number of cloudy days, 10.3; fair days, 13.5; clear days, 7.2.

Warmest day, 5th; coolest day, 8th.

Prevailing winds, west and northwest; greatest force of wind reported from Marion on the 13th—45 miles per hour from the west; Mobile reports, on the 6th, 28 miles per hour from the southeast.

#### GEORGIA.

The following meteorological summary is taken from the report of Hon. J. T. Henderson, commissioner of agriculture for the State of Georgia:

Districts.	Temperature.			Precipitation.
	Mean of maximum.	Mean of minimum.	Monthly mean.	
	°	°	°	Inches.
Northern Georgia.....	94.5	58.8	77.2	4.59
Middle Georgia.....	95.7	64.0	80.4	3.34
Southwestern Georgia.....	94.0	72.0	83.0	6.25
Southeastern Georgia.....	91.8	69.5	80.2	2.72
Eastern Georgia.....	95.5	64.5	82.2	3.81
Means for State.....	94.3	65.7	81.2	4.04

#### ILLINOIS.

The following meteorological summary is from the July report of the "Illinois Weather Service," under direction of Mr. S. D. Fisher:

Districts.	Temperature.			Precipitation.	Average number of rainy days.
	Mean of maximum.	Mean of minimum.	Monthly mean.		
	°	°	°	Inches.	
Northern counties.....	89.8	54.1	71.1	5.97	11
Central counties.....	92.1	59.2	73.5	3.62	12
Southern counties.....	95.0	64.8	76.8	3.97	10
Averages for State.....	92.3	59.2	73.8	4.52	11

#### INDIANA.

The following meteorological summary is taken from the July report of the "Indiana Weather Service":

Districts.	Temperature.			Precipitation.
	Mean of maximum.	Mean of minimum.	Monthly mean.	
	°	°	°	Inches.
Northern counties.....	90.0	56.7	73.61	3.98
Central counties.....	90.2	57.3	72.4	4.99
Southern counties.....	92.1	58.6	74.6	4.74
Averages for State.....	90.8	57.5	73.6	4.57



## IOWA.

July, 1884, was fair, cool, and calm, with moderate excess of rainfall.

The mean temperature was  $2^{\circ}$  below normal; during the past forty-five years the July temperature has been as much, or more, below normal in sixteen years. The first and second decades were decidedly cold, being  $3^{\circ}$  and  $4\frac{1}{2}^{\circ}$  below normal; but the third decade was hot, being  $1\frac{1}{2}^{\circ}$  above normal. The 17th was the coldest day, being  $11^{\circ}$  below normal; the 23d was the hottest day, with  $10^{\circ}$  above normal. The black-bulb sun thermometer averaged  $68^{\circ}.4$  above the air temperature at noon, and reached  $154^{\circ}$  on the 23d.

The mean cloudiness was nearly normal, but the number of clear days was high.

The number of thunder-storms was high, and several were quite severe, locally accompanied with high wind or hail. The most extended of these was the squall of the afternoon and evening of the 11th, extending from Palo Alto to Johnson County, and considerable damage was done in a narrow belt from Hamilton County southeast by hail. The thunder-storm of the evening of the 23d and early morn of the 24th was most severe from Dallas to Marion County. The thunder-storm of the evening of the 4th was most severe in middle Eastern Iowa. Three very small tornadoes reached the ground over a short distance in Sioux City, Woodbury County, near Denison, Crawford County, and near Hubbard, Hardin County. This brings the latest summer date of tornadoes in Iowa two days further; but the damage done to life and property by these tornadoes was less than what lightning and hail did during the same storm in other parts of Iowa.

For the State at large the weather has been favorable. No continued rains having occurred, haying has been interfered with but little, and harvesting is progressing finely; the timely showers and intense insolation during the month, with hot weather during the last decade, have added immensely to the corn prospect, which has not been as good as now in Iowa for several years.

GUSTAVUS HINRICHS.

CENTRAL STATION, I. W. S., August 1, 1884.

## KANSAS.

Prof. J. T. Lovewell, director of the Kansas Weather Service, furnishes the following meteorological summary of observations made at Washburn College, Topeka:

Temperature of the air.	June 20 to 30.	July 1 to 10.	July 10 to 20.	Mean.
<b>Minimum and maximum averages:</b>				
Minimum.....	68	62	66	.....
Maximum.....	96	85	97	.....
Minimum and maximum.....	82	73.5	83	.....
Range.....	28	23	31	.....
<b>Tri-daily observations:</b>				
7 a. m.....	72.4	71.3	71.7	71.8
2 p. m.....	86.5	87.0	84.8	86.1
9 p. m.....	73.2	75.4	75.4	74.7
Mean.....	77.4	77.4	76.4	77.1
<b>Relative humidity:</b>				
7 a. m.....	.89	.80	.88	.86
2 p. m.....	.69	.55	.70	.65
9 p. m.....	.85	.77	.85	.82
Mean.....	.82	.71	.81	.78
<b>Pressure as observed:</b>				
7 a. m.....	29.084	28.965	29.023	29.004
2 p. m.....	28.990	28.948	28.991	28.976
9 p. m.....	28.993	28.949	29.020	28.987
Mean.....	28.996	28.954	29.011	28.989
<b>Miles per hour of wind:</b>				
7 a. m.....	.....	9.8	.....	.....
2 p. m.....	.....	12.6	.....	.....
9 p. m.....	.....	7.5	.....	.....
Total miles.....	1,630	2,413	1,964	6,007
<b>Cloudiness, by tenths:</b>				
7 a. m.....	4.4	4.7	4.6	4.6
2 p. m.....	4.7	2.5	4.5	3.9
9 p. m.....	2.6	3.0	4.3	3.3
<b>Rain:</b>				
Inches.....	2.29	1.78	2.78	6.80

## LOUISIANA.

The weather, except for the high temperature, was without any special feature. The hot wave was present all over the State, reaching extreme figures in the north-western parishes. At Minden nineteen days out of the month the mercury was over

*Temperature.*—The mean temperature of the air was 74.6. The average of all noon 100°; at Shreveport the thermometer registered over 100° on fourteen days. This has been the hottest July for twelve years. The lowlands have had cooler days, but warmer nights, the daily range appearing greatest on the uplands.

On the 10th a heavy storm, with vivid electric phenomena, occurred at Donaldsonville.

A heavy wind storm from the west, velocity 37 miles per hour, occurred at New Orleans on the 26th.

Thunder-storms occurred at New Orleans on the 6th, 7th, 10th, 15th, and 26th.

Crops are reported excellent on the lowlands, but they need rain on the hills and prairies.

*State summary.*—Mean temperature, 84° 6, against 78° 5 for June; highest temperature, 106° at Minden, on the 8th; lowest temperature, 59° at Opelousas, on the 28th; greatest daily range of temperature, 38° at Alexandria, on the 1st; least daily range of temperature, 8° at Natchitoches, on the 18th.

Average rainfall, 2.40 inches; greatest daily rainfall, 2.04 inches at Opelousas, on the 24th; largest monthly rainfall, 4.88 inches at Lafayette.

Average number of rainy days, 5.6.

The Mississippi River at New Orleans fell 3 feet 10 inches during the month; and the Red River at Shreveport fell 11 feet and 2 inches.

The following extract is from the "Michigan Crop Report" for July, 1884, prepared under the direction of the State secretary:

"The weather during harvest time was exceptionally fine. The rainfall at Lansing during July amounted to 3.24 inches, as compared with 10.12 inches for July, 1883. The weather during the last week of the month was unusually cool for the time of year. Light frosts were observed on the mornings of the 8th and 9th."

The Chief Signal Officer has received a valuable report on the principal meteorological conditions in Michigan during the year 1882, by the Michigan State board of health, Dr. Henry B. Baker, secretary.

#### MISSOURI.

The mean temperature during the past month has been 77° 6, which is 1° 6 below the normal for July at Saint Louis. The daily means were with very little range during the whole month.

The mean daily range was 15° 4, with small ranges on the 5th, 15th, and 17th.

The maximum temperatures were generally observed on the 8th of the month, with some few exceptions for the 23d.

The minimum temperature at the central station was observed on the 14th. The range of the minimum temperatures was remarkably small, the mean minimum being 69° 9.

The rainfall at the central station was 2.94 inches, which is 1.22 inches below the normal amount for July. This amount, however, has generally been exceeded in the other parts of the State, Hannibal, Keokuk, and Mascoutah, only, registering as low or below. The largest amount has been in the central part of the State, with larger amounts in the southeastern, central-southern, and northwestern portions. A remarkably heavy rainfall was observed at Miami on the 13th, 5.25 inches falling in twelve hours.

In some parts of the State there has been a great number of thunder-storms, generally in the vicinity of the Missouri and Mississippi Rivers.

Hail fell at Ironton on the 5th, at Chamois on the 5th and 15th, at Mexico on the 12th, and at Miami, with damaging results to the corn crop, on the 27th.

Glasgow and Lexington report that the large amounts of rain did damage to the wheat in the shock and the hay. The corn and tobacco crops are generally reported as doing finely, the corn in some localities being extra fine and beyond the danger of drought.

A. RAMEL,  
*Assistant in charge.*

WASHINGTON UNIVERSITY, August 8, 1884.

#### NEBRASKA.

The general character of the month was cool, with rainfall considerably above the normal.

*Rainfall.*—The average by sections was as follows: southeast, 7.40 inches; northeast, 6.07 inches; southwest, 7.85 inches; northwest, 4.27 inches; average for the entire State, 6.55 inches.

*Relative humidity.*—Mean relative humidity at Omaha, 65.0 per cent.; North Platte, 70.9 per cent.; De Soto, 82.7 per cent.

observations was 83.8. The following are some of the maximum and minimum temperatures:

Stations.	Max. tem- perature.	Min. tem- perature.
	o	o
Omaha.....	97.3	57.5
North Platte.....	97.0	55.0
De Soto.....	94.0	55.0
Crete.....	95.6	52.4

*Wind*.—Number of miles traveled: Omaha, 5,385; North Platte, 7,187; Crete, 7,498. Highest velocity: Omaha, 42 miles, from north; North Platte, 47 miles, from west; Crete, 50 miles, from north.

*Hail*.—Hail was reported at Superior on the 30th; Marquette on the 20th; Dawson on the 29th; Stromsburg on the 13th and 27th, and Fremont on the 18th.

#### NEW JERSEY.

The following extract is from the "New Jersey Weather Review" for July, 1894, prepared under the direction of Mr. W. Earle Cass, of Newark:

"The temperature ranged from 97° at Salem to 54° at Newark and Lambertville; the mean temperature of the State, as represented by twelve stations, being 70° 90, which is several degrees below the average of past years.

"The rainfall varied from 2.20 inches at Salem to 6.48 inches at Paterson, the average for eighteen stations being 4.96 inches. The rainy days ranged from seven to seventeen in different parts of the State.

"Warm days (between 65° and 84°) about twenty-three in number. Hot days (maximum temperature between 85° and 95°), about seven. No very hot days were reported (maximum temperature over 95°).

"Prevailing wind, southwest to northwest.

#### OHIO.

The atmospheric pressure for the month of July was somewhat lower than during the corresponding month of last year. The difference is approximately one-tenth of an inch, alike for the mean, the maximum, and the minimum. The lowest barometer was recorded on the last day of the month, and no extraordinary fluctuations are reported.

The temperature was, on the whole, somewhat lower than for July of last year. The mean temperature was 71° 5 against 72° 1 for last year. The highest temperature observed was 96° 0, at Waverly, the maximum for the same month of last year being 97° 8. Minimum temperature, which was 41°, recorded at Lebanon, was more than 2° lower than that of July, 1893.

The noticeable feature of the weather for the month was the absence of rain during the greater part of it. During the last third of the month of June and nearly all of July, very little rain fell, the severe drought extending over nearly all of the State. Heavy rains occurred very generally during the last week of July, and the total precipitation for the month, as shown in the summary, was brought nearly up to that of last year, and somewhat above the normal amount for July.

The prevailing direction of the wind was from the northwest.

#### State summary.

Mean barometer, 29.900 inches.

Highest barometer, 30.279 inches, on the 3d at Jefferson.

Lowest barometer, 29.569 inches, on the 31st at Jefferson.

Range of barometer, 0.710 inch.

Mean relative humidity, 70.1 per cent.

Mean temperature, 71° 5.

Highest temperature, 96° 0, on the 24th at Waverly.

Lowest temperature, 41° 0, on the 21st at Lebanon.

Range of temperature, 55° 0.

Mean daily range of temperature, 21° 7.

Greatest daily range of temperature, 49° 5, on the 22d at Ohio State University.

Least daily range of temperature, 3° 0, on the 19th at Jefferson.

Number of clear days, 11.7.

Number of fair days, 14.2.

Number of cloudy days, 5.1.

Number of days on which rain fell, 10.5.

Mean rainfall, 3.83 inches.

Average daily rainfall, .123 inch.

Greatest rainfall, 6.60 inches, at Junction.

Least rainfall, 1.70 inches, at College Hill.

## TENNESSEE.

The weather during July presented many unusual features, the chief of which were the extraordinary electrical disturbances and the amount of rainfall. The storms which prevailed were, many of them, general in their character, and some of them, notably those of the 5th, 9th, and 30th, were quite destructive to the growing crops. The mean temperature for the month was 76°, which is 4° above that for the preceding month, and 2° above that for July, 1883. The highest temperature was 99°, which is 1° above July, 1883; the lowest was 46°, or 10° below July of last year; the mean of the maximum and minimum temperatures differed very slightly from those of 1883. The high temperatures were general about the 5th and 24th, and the low temperatures about the 7th. The average rainfall for the month was 5.55 inches, which is 0.25 inch greater than that for the preceding month, and 1.67 inches greater than that for July, 1883, which was itself an unusual amount for July. The days of greatest rainfall were the 4th, 9th, 15th, 18th, and from the 25th to 31st inclusive. The greatest daily rainfall occurred on the 31st, when an average of 1.03 inches fell throughout the State. Many of these rains were general, and many of them were accompanied by severe electric storms.

*State summary.*—Mean temperature, 76°; highest temperature, 99°, on the 4th, at Hohenwald, and on the 9th, at Woodstock; lowest temperature, 46°, on the 21st, at Andersonville; range of temperature, 53°; greatest daily range of temperature, 36°, on the 21st, at Andersonville, and on the 23d at Hohenwald; least daily range of temperature, 0° on the 30th, at Franklin, and 1° on the 26th, at Kingston Springs, and on the 30th at Hardison's Mills. Mean depth of rainfall, 5.55 inches; mean daily rainfall, .179 inch; greatest rainfall, 10.62 at Manchester; least rainfall, 1.98 at Woodstock. Average number of clear days, 9; fair days, 13; cloudy days, 9; average number of days on which rain fell, 11.6. Prevailing winds, west and southwest.

## MISSISSIPPI.

The month was characterized by marked variations in temperature at nearly every station, and by great contrasts between the temperatures of different stations. The eastern side of the State showed the highest temperature, the thermometer several times reaching 100° in Okolona, Columbus, Macon, and Meridian. The average temperature for the whole State was 82.15. The July average for a number of years is about 82.

The rainfall varied greatly in different parts of the State as shown by the tabulated amounts. The heaviest daily falls were, on the 18th, 2.15 inches in Waynesboro; on 24th, 4.30 inches in Columbus, 2.99 inches in Aberdeen, 3.05 inches in Corinth, 2 inches in Holly Springs, and 2.50 inches in Hernando; and 3 inches in Corinth on the 31st.

The following tabulated statement is taken from the daily reports received from the stations named:

Stations.	Monthly mean temperature.	Highest temperature.	Dates.	Lowest temperature.	Dates.	Highest daily mean temperature.	Dates.
Corinth.....	77.3	98		52	30	88.5	5
Hernando.....	80.4	101	2, 23, 24	56	28	88	9
Woodcoke, near Lamar.....	82.0	94	5, 9	72	8, 29, 30	87	5
Holly Springs.....	80.1	96		66	11, 12, 28	84.5	5, 9
Batesville.....	82.3	100	8	62	11	87	9
Oxford.....	80.7	98	9	61	12	85	9
Grenada.....	81.7	99	9	68	25	83.5	9
Okolona.....	84.3	104	24	64	8	90	14
Aberdeen.....	80.3	98	9	61	28	86	5
Columbus.....	83.2	102	3, 5, 12, 22	65	8	87.5	3
Macon.....	84.1	101	5	67	8	88.5	5
Meridian.....	83.7	104	13	66	8	89	13
Lake.....	81.0	98	9	65	8, 9	84.5	29
Jackson.....	84.4	104	5, 12	66	10	88	6, 29
Vicksburg.....	84.4	100	30	70	4	88	6, 30
Natches.....	83.7	96	9	73	{ 1, 12, 21, 22, 23, 25 }	86	10
Brookhaven.....	83.9	99	9	68	20	87	30
Waynesboro.....	81.9	100	6	65	8, 9	87	6
Edwards.....	84.0	98	23	69	2	83.5	30
Memphis, Tenn.....	82.3	96	5, 9, 23	70	11, 12, 28	88	5, 9
Grand Junction, Tenn.....	79.6	96	9	74	8, 11, 12	84.5	5

Stations.	Lowest daily mean.	Dates.	Greatest daily range.	Dates.	Least daily range.	Dates.	No. of days rain fell.	Rainfall.
Corinth.....	68.5	30	33	30	15	14	7	2.44
Hernando.....	73	26	39	25	11	15	4	4.38
Woodcote, near Lamar.....	76	30	20	8	2	15	9	5
Holly Springs.....	75.5	11	25	12, 23	10	3	9	5.94
Batesville.....	76	11	30	7, 9	15	31	13	6.32
Oxford.....	76	16	32	12	11	30	5	2.81
Grenada.....	78.5	11, 12, 29, 31	35	25	17	11, 31	5	2.83
Okolona.....	78	8	33	23	14	26	8	0.79
Aberdeen.....	69	28	26	9, 22	2	25, 26	5	4.87
Columbus.....	79.5	26	31	8, 16, 22, 23	12	28	8	9.05
Macon.....	79	1, 8	31	10	12	18	8	5.18
Meridian.....	75	1	40	13	15	18	2	0.08
Lake.....	77	16	33	9	14	16	8	4.98
Jackson.....	79.5	10	32	12	14	16	4	0.17
Vicksburg.....	81.5	25	26	12	8	18	6	8.58
Natchez.....	80.5	24	22	12	11	24	7	0.83
Brookhaven.....	80.5	1, 20	26	9	18	14, 15, 18	2	0.46
Waynesboro.....	78	8, 11	32	9	10	11	14	7.47
Edwards.....	81	16	28	2	14	24	6	3.24
Memphis, Tenn.....	78.5	11	24	9	9	31	7	2.01
Grand Junction, Tenn.....	75.5	11	29	22, 23	13	31	11	5.11

R. B. FULTON, *Director.*UNIVERSITY OF MISSISSIPPI,  
August 12, 1884.

## XXII.

## ADDRESSED TO LEGISLATORS AND OTHERS.

AUBURN, ALA., *September 8, 1884.*

DEAR SIR: During the next session of the general assembly an effort will be made to secure the establishment of the weather service as a purely State institution. This communication is addressed to you to solicit your interest and influence in the enterprise. The successful operation of the system during the past few months has demonstrated beyond a doubt what a great benefit it will be to the whole people of the State if properly conducted.

Several of the States in the Union have already recognized the practical benefits accruing to the people by an elaborate meteorological system, and have established Weather Bureaus, and appropriated sufficient money to equip them thoroughly. Alabama is now called upon to take a step in the same direction.

The plan of the State service is to have a central office and a State director, and in each county at least one station well equipped with standard instruments. These stations will be placed in charge of competent men, who will keep careful records of temperature, rainfall, storms, frosts, and other atmospheric phenomena, and report the same to the director at such times and in such ways as may be found most advantageous. The director will publish at the close of each month a weather bulletin prepared from the reports received from these county stations. It will also be desirable to have at least one barometric station in each senatorial district to furnish data for the study of tornadoes and other destructive storms.

The director will be in immediate communication with the Chief Signal Officer at Washington, who will furnish by telegraph each day, without cost to the State, predictions of the weather twenty-four hours in advance. Through the co-operation of the railroads, already assured, the director will be enabled to have displayed at each telegraph station suitable signals designating the changes in the weather thus predicted, with but slight cost to the State system. The people will be thus warned of the approach of cold waves, heavy frosts, and violent storms of wind and rain.

Such a system as the one proposed will bring the benefits of the Signal Service of the United States into every county participating in the State service. It will be the means of soon securing better predictions of weather changes and of storms. It will give to every county the Government standards for temperature, rainfall, wind, veloc-

ity, humidity, &c., which are sources of useful public information. It will put within reach of local agricultural clubs means of accurate observations, which, in the course of years, must be valuable to any locality in the study of the adaptation and cultivation of the various plants that are of interest to the farmer. It will bring the science and methods of the National Signal Service within the reach of the principal high schools of the State, offering teachers and pupils alike excellent opportunities for studying the application of this science to agricultural interests.

P. H. MELL, JR.

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XXIII.

[65th General Assembly, Regular Session. H. B. No. 481.]

BY THE COMMITTEE ON AGRICULTURE.

A BILL to establish a Meteorological Bureau for the State of Ohio.

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio*, That there be, and hereby is, established at the State University at Columbus, Ohio, a central office for meteorological observations, with the professor of physics of said university, the secretary of the State board of agriculture, and a third person, to be appointed by the governor, as a board of directors; the members of the board of directors shall be commissioned by the governor, and be duly qualified as like officers of the State.

SEC. 2. The professor of physics of said university is hereby appointed president of the board, and by and with the advice of the directors shall establish, if practicable, one volunteer weather station in each Congressional district, and supervise the same; he shall receive reports therefrom, and reduce the same to tabular form, and report the same monthly to the State printer for publication as the Ohio weather report.

SEC. 3. That the State printer be authorized to print 2,000 copies of each monthly report; 1,000 copies shall be distributed by said board, and 1,000 copies shall be delivered to the secretary of state, to be distributed by him in the same manner as other State documents.

SEC. 4. There is hereby appropriated for the ensuing year, for the establishment and maintenance of said bureau and stations, the sum of \$2,000, or so much thereof as may be necessary for the purpose of meeting the actual expenses of carrying out the provisions of this act; no part of said sum shall be paid for salaries of any officer or for office rent, but a reasonable part of the same may be paid for the services of a clerk at the central station.

SEC. 5. No money shall be expended, except upon the order of the resident director, by and with the approval of the board.

SEC. 6. This act shall take effect from and after its passage.

## APPENDIX 9.

### ABSOLUTE HUMIDITY AND MEAN CLOUDINESS IN THE UNITED STATES REPRESENTED BY TABLES AND CHARTS.

WAR DEPARTMENT, WASHINGTON CITY, October 17, 1884.

The CHIEF SIGNAL OFFICER OF THE ARMY,  
*Washington, D. C.:*

SIR: I have the honor to inclose herewith charts and tables prepared under your direction, in compliance with the request from the Colorado State Medical Society made by resolution of that society at its last annual meeting in Denver, Colo., January 15, 1884. Copy of the resolutions herewith.

Owing to a pressing demand for the reply to this request, I was unable to collect the necessary data, extending over a series of years, and as reliable estimates showed that the mean values of the data considered for 1882 or 1883 would not vary 5 per cent. from the means determined for a series of years, I calculated the absolute humidity for each season of the year at the stations of the Signal Service during the year 1883, and this expressed the weight of vapor in grains contained in each cubic foot of air, and was entered upon the chart at the station of observation.

Lines of equal absolute humidity were then traced upon the charts for each half grain in weight of vapor contained in each cubic foot of air. These charts, therefore, exhibit the relative dryness of the atmosphere during each season of the year in the several sections of the country. The lines of equal absolute humidity are traced for each half grain, and the shades are given for each whole grain in weight.

The service not having actual records of the duration of sunshine at Signal Service stations, it was presumed that charts exhibiting the average amount of cloudiness during each season of the year would prove interesting to the society, and I therefore prepared four charts showing the amount of cloudiness at the several stations during the year 1882. The mean cloudiness is given on a scale of 0 to 10, zero indicating total absence of clouds and 10 complete cloudiness, and a scale of shades indicating amount of cloudiness accompanies each of the four charts. The data used in preparing these charts were obtained from the three tri-daily telegraphic reports, the observations being taken at 7 a. m., 3 p. m., and 11 p. m., Washington time.

In addition to the charts requested, I have prepared a table to accompany this report, in which will be found the mean temperature, mean relative humidity, mean dew point, mean vapor tension, and mean absolute humidity for each season of 1883 at all Signal Service stations, and also the mean cloudiness, mean maximum temperature, mean minimum temperature, and mean daily range of temperature for each season of 1882, all of which may prove of interest to the members of the society making this request.

I am, very respectfully, your obedient servant,

H. H. C. DUNWOODY,  
*First Lieutenant, Fourth Artillery,  
Acting Signal Officer and Assistant.*

DENVER, COLO., January 15, 1884.

DEAR SIR: At the last annual meeting of the Colorado State Medical Society, the following resolution was unanimously adopted, and the undersigned were appointed a committee to consult with you in reference to the object herein named:

"Resolved, That the society respectfully and earnestly request the Chief Signal Officer, U. S. A., to furnish for publication in the annual report of the Signal Service Bureau, and in the Transactions of this society, two series of four maps each, in colors; one series giving by seasons the ratio of sunshine; and the other, the absolute amount

of moisture or grains of vapor in a cubic foot of air; and that the cost, so far as this society's Transactions is concerned, be borne as a part of the publication expenses of the Colorado State Medical Society."

We would respectfully call attention to the fact that data in regard to sunshine and the dryness of the air are of the utmost importance to that large invalid class who are troubled with consumption, asthma, malaria, and kindred complaints, and likewise to the sixty thousand physicians in our country. We would submit further, that in furnishing these data the Signal Service can do more important work on land than it is now doing by saving life at sea, and that the health of a community is of as much importance as its commerce or agriculture.

The population of the State of Colorado and adjoining States is largely composed of persons who have sought and obtained a restoration of health in them, and the maps we ask for would be of the greatest utility to these and to the still larger class of invalids in the East and South who are eagerly seeking for a sanitarium combining sunshine and dry air.

The object of our request is to place in as graphic and as striking a manner as possible these facts, so that we may be furnished, from the reliable source of the Signal Service Bureau, with diagrams which will accurately portray the amount of sunshine and the dryness of the air in the several parts of our country.

As the resolution indicates, we, representing the medical profession of a large and growing section of this country, and speaking in the interests of our professional brethren and also of the consumptive class the country over, request you to furnish two series of maps, by preference of the size of your district map; the one series to show by coloring, as in your precipitation and other charts, the average of sunshine for the several districts in our country, by seasons; the other series to show the absolute humidity of the air for the same sections, by seasons. We would suggest that if hypsometric lines could be introduced on these maps, it would furnish additional information of value. In doing this we do not ask for any change in your methods of observation, but simply that the data collected may be put in the most available form.

Hoping for an early and favorable reply, we are most respectfully yours,

CHARLES DENISON, M. D.,

SAML. AUG. FISH, M. D.,

W. S. COCKRELL, M. D.,

*Committee.*

Brigadier and Brevet Major General W. B. HAZEN,  
*Chief Signal Officer, United States Army.*

6730 SIG—9



Table showing the mean temperature, relative humidity, dew-point, cloudiness, maximum, minimum, and daily range of temperature, vapor tension, and absolute humidity, for each of the four seasons, at stations of the Signal Service, United States Army.

[Compiled for the year specified.]

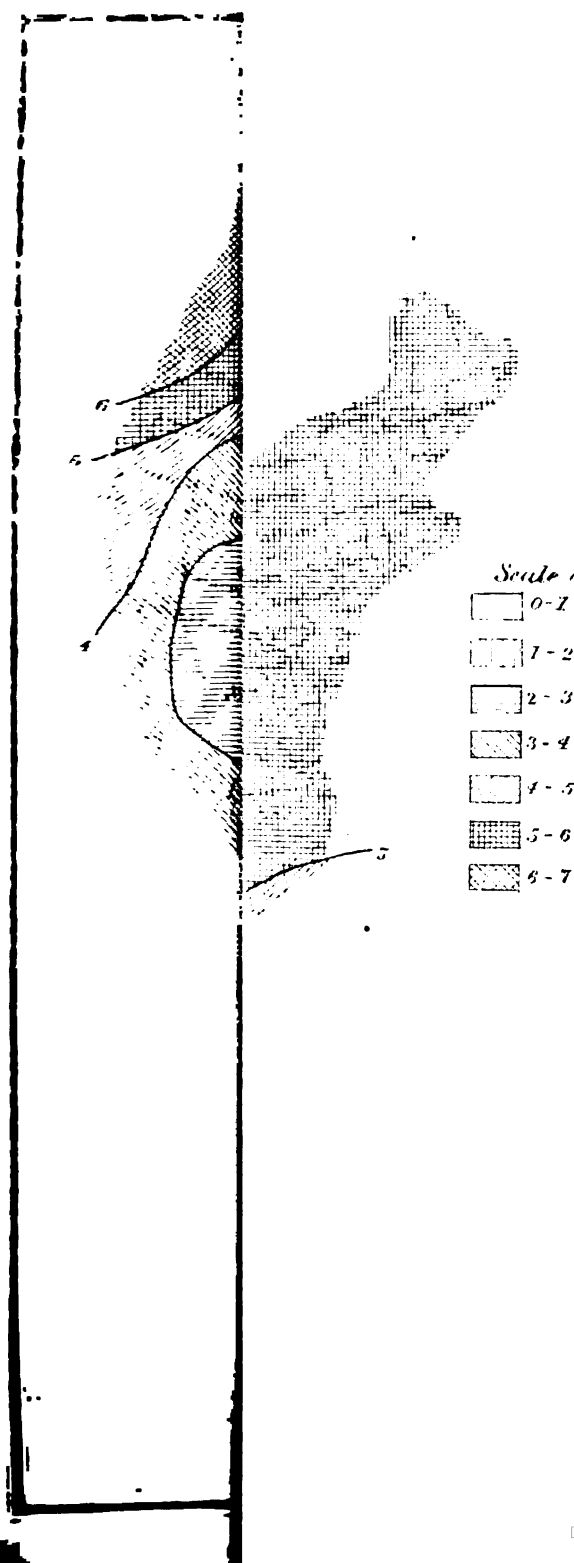
Stations.	1882											
	Mean cloudiness (scale of 0 to 10).				Mean maximum temperature.				Mean minimum temperature.			
	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Albany, N. Y.	3.8	1.1	6.0	6.8	54.3	72.9	61.3	36.4	38.9	63.4	47.2	22.2
Albany, Mich.	3.6	0.0	2.5	7.8	44.1	70.7	54.9	30.2	27.4	54.1	40.9	16.5
Albany, Fort, Ariz.	2.4	4.7	2.0	3.4	70.1	88.1	71.3	53.0	32.0	52.6	33.5	22.2
Albuquerque, Fort, Mont.	2.4	2.2	4.1	4.8	50.3	80.5	53.1	30.5	29.6	54.5	32.6	16.5
Atlanta, Ga.	3.0	5.7	4.4	4.8	71.7	83.8	70.7	55.4	53.8	68.4	55.0	39.8
Atlantic City, N. J.	4.6	4.8	5.2	5.2	53.9	76.9	63.1	41.9	39.9	64.2	51.2	27.1
Augusta, Ga.	4.6	4.6	4.6	5.8	75.8	84.6	74.6	60.5	55.9	70.8	56.1	41.9
Baltimore, Md.	4.1	5.2	5.0	5.2	60.0	83.0	64.6	43.5	44.3	67.5	55.2	30.7
Barnegat City, N. J.	4.7	4.6	5.3	5.3	52.1	76.9	62.2	40.4	39.7	63.7	51.6	28.9
Bennett, Fort, Dak.	4.1	4.6	4.9	4.7	56.0	83.1	60.8	37.0	33.7	57.6	36.1	9.1
Benton, Fort, Mont.	5.9	3.4	4.4	5.0	45.4	83.3	54.2	38.9	30.6	55.0	32.8	11.7
Bismarck, Dak.	5.7	4.7	4.1	4.1	48.4	78.5	59.4	40.0	38.2	56.7	34.5	8.7
Black Island, R. I.	4.9	2.0	4.8	4.9	49.3	73.6	59.4	27.0	28.4	56.7	34.5	8.7
Boston, Mass.	4.2	4.6	5.1	5.2	49.4	80.4	60.4	37.8	33.9	56.1	36.5	20.1
Brownsville, Tex.	6.6	6.1	3.4	6.0	81.2	90.4	83.3	71.8	66.4	55.1	64.4	55.1
Buffalo, N. Y.	6.3	5.5	5.3	7.6	47.9	72.0	58.8	34.9	34.3	59.7	44.9	22.8
Bufford, Fort, Dak.	5.9	2.3	4.4	4.4	50.9	82.8	54.8	27.9	27.8	52.8	32.7	4.8
Cañero, Ill.	5.4	4.9	4.9	6.4	66.0	83.0	68.7	48.0	51.4	69.0	54.1	34.6
Cape Henry, Va.	5.3	4.7	4.8	5.4	61.9	82.6	63.4	48.9	47.1	66.6	55.9	35.8
Cape May, N. J.	5.8	4.8	4.9	5.3	56.7	77.1	66.1	44.8	42.2	66.6	55.3	31.3
Cape Mendocino, Cal.	3.8	0.8	2.5	3.0	54.8	80.0	60.5	55.3	43.2	48.1	46.8	43.6
Cedar Key, Fla.	2.9	5.2	3.0	4.0	78.9	86.8	76.6	66.1	65.7	75.7	65.4	53.6
Charlotte, N. C.	4.5	5.0	4.4	4.2	74.7	88.8	74.4	61.1	59.4	73.3	60.7	46.1
Charlotte, N. C.	5.6	5.6	4.4	5.8	69.7	83.4	69.5	51.5	50.4	69.5	62.5	38.7
Charleston, S. C.	5.2	4.6	4.6	6.3	70.9	84.6	70.2	62.0	52.1	67.2	51.3	38.0
Chattanooga, Tenn.	4.8	3.8	2.7	3.1	53.9	80.2	59.4	39.9	29.6	50.5	31.3	17.4
Cheyenne, Wyo.	4.2	5.0	4.0	5.3	52.8	74.6	61.3	38.4	38.6	61.5	49.2	24.4
Chicago, Ill.	3.5	4.8	4.7	5.5	56.8	79.5	65.8	45.0	43.2	63.7	53.4	31.4
Cincinnati, Ohio	3.7	5.3	4.9	7.3	63.2	81.8	68.4	48.6	47.5	67.1	52.4	38.4

### REPORT OF THE CHIEF SIGNAL OFFICER.

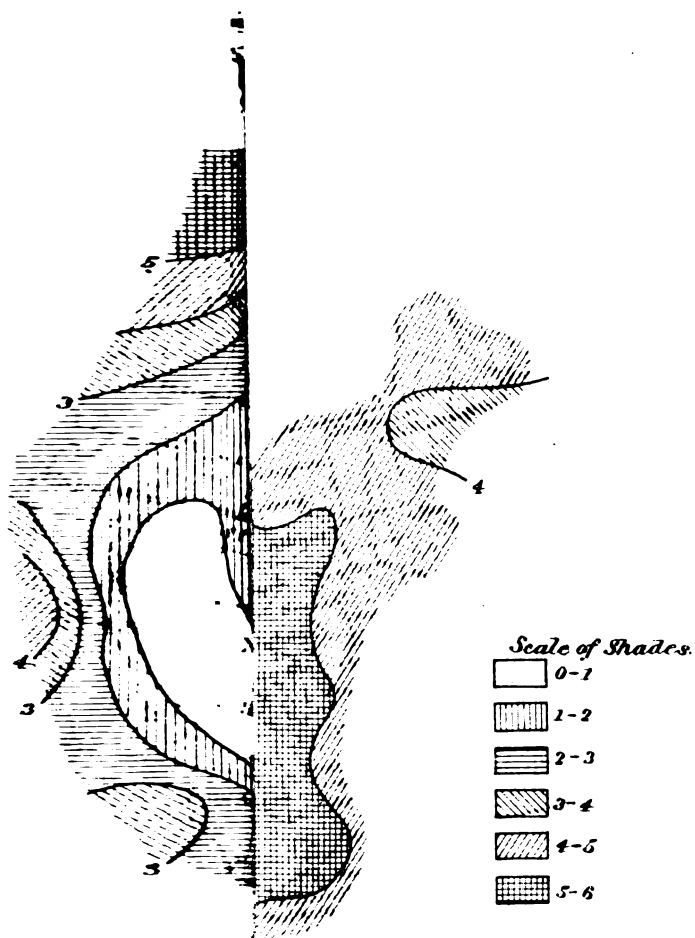
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6.3	5.0	5.4	7.1	52.6	70.1	61.0	87.4	87.4	60.5	44.2	15.3	14.9	12.1
6.2	4.9	5.3	7.0	51.5	69.0	60.0	86.3	86.3	59.4	43.1	14.2	13.8	11.0
6.1	4.8	5.2	6.9	50.4	67.9	58.9	85.2	85.2	58.3	42.0	13.1	12.7	10.9
6.0	4.7	5.1	6.8	49.3	66.8	57.8	84.1	84.1	57.2	40.9	12.0	11.6	10.8
5.9	4.6	5.0	6.7	48.2	65.7	56.7	83.0	83.0	56.1	39.8	10.9	10.5	10.6
5.8	4.5	4.9	6.6	47.1	64.6	55.6	81.9	81.9	55.0	38.7	9.8	9.4	9.5
5.7	4.4	4.8	6.5	46.0	63.5	54.5	80.8	80.8	53.9	37.6	8.7	8.3	8.4
5.6	4.3	4.7	6.4	44.9	62.4	53.4	79.7	79.7	52.8	36.5	7.6	7.2	7.3
5.5	4.2	4.6	6.3	43.8	61.3	52.3	78.6	78.6	51.7	35.4	6.5	6.1	6.2
5.4	4.1	4.5	6.2	42.7	60.2	51.2	77.5	77.5	50.6	34.3	5.4	5.0	5.1
5.3	4.0	4.4	6.1	41.6	59.1	50.1	76.4	76.4	49.5	33.2	4.3	3.9	4.0
5.2	3.9	4.3	6.0	40.5	58.0	49.0	75.3	75.3	48.4	32.1	3.2	2.8	2.9
5.1	3.8	4.2	5.9	39.4	56.9	47.9	74.2	74.2	47.3	31.0	2.1	1.7	1.8
5.0	3.7	4.1	5.8	38.3	55.8	46.8	73.1	73.1	46.2	29.9	1.0	0.6	0.7
4.9	3.6	4.0	5.7	37.2	54.7	45.7	72.0	72.0	45.1	28.8	0.0	0.0	0.0
4.8	3.5	3.9	5.6	36.1	53.6	44.6	70.9	70.9	44.0	27.7	0.0	0.0	0.0
4.7	3.4	3.8	5.5	35.0	52.5	43.5	69.8	69.8	42.9	26.6	0.0	0.0	0.0
4.6	3.3	3.7	5.4	33.9	51.4	42.4	68.7	68.7	41.8	25.5	0.0	0.0	0.0
4.5	3.2	3.6	5.3	32.8	50.3	41.3	67.6	67.6	40.7	24.4	0.0	0.0	0.0
4.4	3.1	3.5	5.2	31.7	49.2	40.2	66.5	66.5	39.6	23.3	0.0	0.0	0.0
4.3	3.0	3.4	5.1	30.6	48.1	39.1	65.4	65.4	38.5	22.2	0.0	0.0	0.0
4.2	2.9	3.3	5.0	29.5	47.0	38.0	64.3	64.3	37.4	21.1	0.0	0.0	0.0
4.1	2.8	3.2	4.9	28.4	45.9	36.9	63.2	63.2	36.3	20.0	0.0	0.0	0.0
4.0	2.7	3.1	4.8	27.3	44.8	35.8	62.1	62.1	35.2	18.9	0.0	0.0	0.0
3.9	2.6	3.0	4.7	26.2	43.7	34.7	61.0	61.0	34.1	17.8	0.0	0.0	0.0
3.8	2.5	2.9	4.6	25.1	42.6	33.6	59.9	59.9	33.0	16.7	0.0	0.0	0.0
3.7	2.4	2.8	4.5	24.0	41.5	32.5	58.8	58.8	31.9	15.6	0.0	0.0	0.0
3.6	2.3	2.7	4.4	22.9	40.4	31.4	57.7	57.7	30.8	14.5	0.0	0.0	0.0
3.5	2.2	2.6	4.3	21.8	39.3	30.3	56.6	56.6	29.7	13.4	0.0	0.0	0.0
3.4	2.1	2.5	4.2	20.7	38.2	29.2	55.5	55.5	28.6	12.3	0.0	0.0	0.0
3.3	2.0	2.4	4.1	19.6	37.1	28.1	54.4	54.4	27.5	11.2	0.0	0.0	0.0
3.2	1.9	2.3	4.0	18.5	36.0	27.0	53.3	53.3	26.4	10.1	0.0	0.0	0.0
3.1	1.8	2.2	3.9	17.4	34.9	25.9	52.2	52.2	25.3	9.0	0.0	0.0	0.0
3.0	1.7	2.1	3.8	16.3	33.8	24.8	51.1	51.1	24.2	7.9	0.0	0.0	0.0
2.9	1.6	2.0	3.7	15.2	32.7	23.7	50.0	50.0	23.1	6.8	0.0	0.0	0.0
2.8	1.5	1.9	3.6	14.1	31.6	22.6	48.9	48.9	22.0	5.7	0.0	0.0	0.0
2.7	1.4	1.8	3.5	13.0	30.5	21.5	47.8	47.8	20.9	4.6	0.0	0.0	0.0
2.6	1.3	1.7	3.4	11.9	29.4	20.4	46.7	46.7	19.8	3.5	0.0	0.0	0.0
2.5	1.2	1.6	3.3	10.8	28.3	19.3	45.6	45.6	18.7	2.4	0.0	0.0	0.0
2.4	1.1	1.5	3.2	9.7	27.2	18.2	44.5	44.5	17.6	1.3	0.0	0.0	0.0
2.3	1.0	1.4	3.1	8.6	26.1	17.1	43.4	43.4	16.5	0.2	0.0	0.0	0.0
2.2	0.9	1.3	3.0	7.5	25.0	16.0	42.3	42.3	15.4	0.0	0.0	0.0	0.0
2.1	0.8	1.2	2.9	6.4	23.9	14.9	41.2	41.2	14.3	0.0	0.0	0.0	0.0
2.0	0.7	1.1	2.8	5.3	22.8	13.8	40.1	40.1	13.2	0.0	0.0	0.0	0.0
1.9	0.6	1.0	2.7	4.2	21.7	12.7	39.0	39.0	12.1	0.0	0.0	0.0	0.0
1.8	0.5	0.9	2.6	3.1	20.6	11.6	37.9	37.9	11.0	0.0	0.0	0.0	0.0
1.7	0.4	0.8	2.5	2.0	19.5	10.5	36.8	36.8	9.9	0.0	0.0	0.0	0.0
1.6	0.3	0.7	2.4	0.9	18.4	9.4	35.7	35.7	8.8	0.0	0.0	0.0	0.0
1.5	0.2	0.6	2.3	0.0	17.3	8.3	34.6	34.6	7.7	0.0	0.0	0.0	0.0
1.4	0.1	0.5	2.2	0.0	16.2	7.2	33.5	33.5	6.6	0.0	0.0	0.0	0.0
1.3	0.0	0.4	2.1	0.0	15.1	6.1	32.4	32.4	5.5	0.0	0.0	0.0	0.0
1.2	0.0	0.3	2.0	0.0	14.0	5.0	31.3	31.3	4.4	0.0	0.0	0.0	0.0
1.1	0.0	0.2	1.9	0.0	12.9	3.9	30.2	30.2	3.3	0.0	0.0	0.0	0.0
1.0	0.0	0.1	1.8	0.0	11.8	2.8	29.1	29.1	2.2	0.0	0.0	0.0	0.0
0.9	0.0	0.0	1.7	0.0	10.7	1.7	28.0	28.0	1.1	0.0	0.0	0.0	0.0
0.8	0.0	0.0	1.6	0.0	9.6	0.6	26.9	26.9	0.0	0.0	0.0	0.0	0.0
0.7	0.0	0.0	1.5	0.0	8.5	0.0	25.8	25.8	0.0	0.0	0.0	0.0	0.0
0.6	0.0	0.0	1.4	0.0	7.4	0.0	24.7	24.7	0.0	0.0	0.0	0.0	0.0
0.5	0.0	0.0	1.3	0.0	6.3	0.0	23.6	23.6	0.0	0.0	0.0	0.0	0.0
0.4	0.0	0.0	1.2	0.0	5.2	0.0	22.5	22.5	0.0	0.0	0.0	0.0	0.0
0.3	0.0	0.0	1.1	0.0	4.1	0.0	21.4	21.4	0.0	0.0	0.0	0.0	0.0
0.2	0.0	0.0	1.0	0.0	3.0	0.0	20.3	20.3	0.0	0.0	0.0	0.0	0.0
0.1	0.0	0.0	0.9	0.0	1.9	0.0	19.2	19.2	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.8	0.0	0.8	0.0	18.1	18.1	0.0	0.0	0.0	0.0	0.0

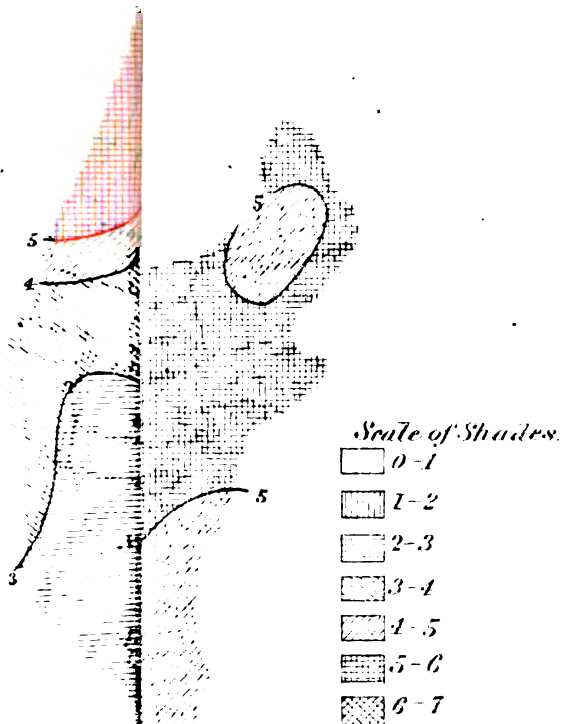






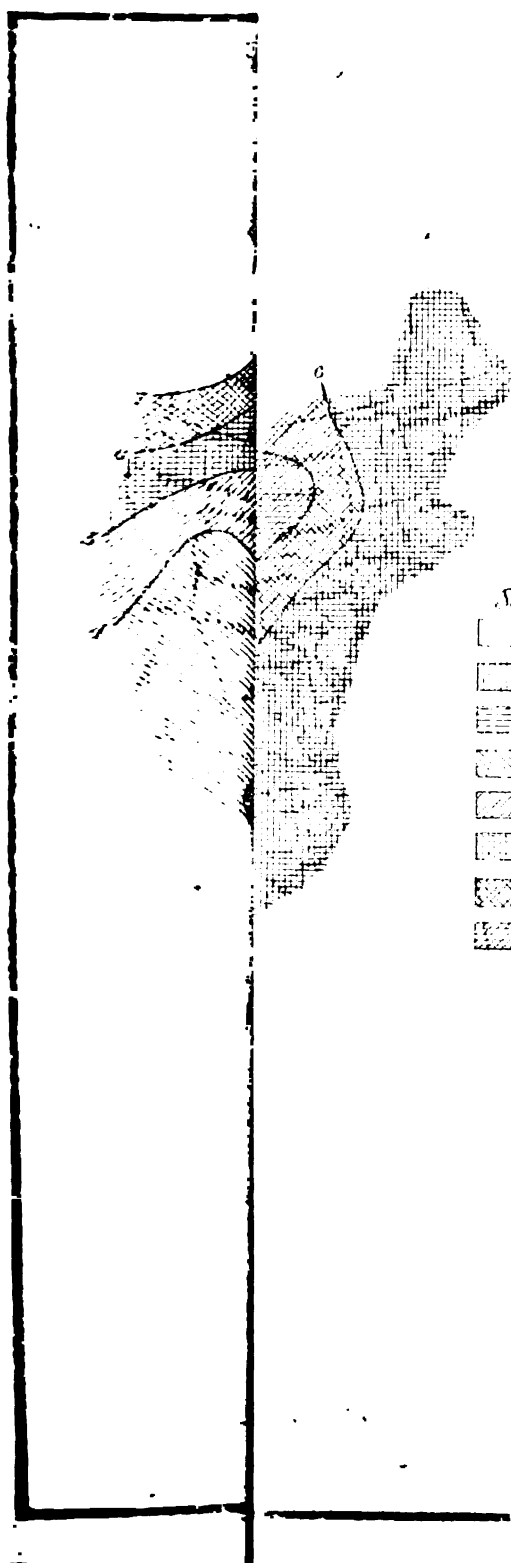












*Scale of Shades.*

0-1

1-2

2-3

3-4

4-5

5-6

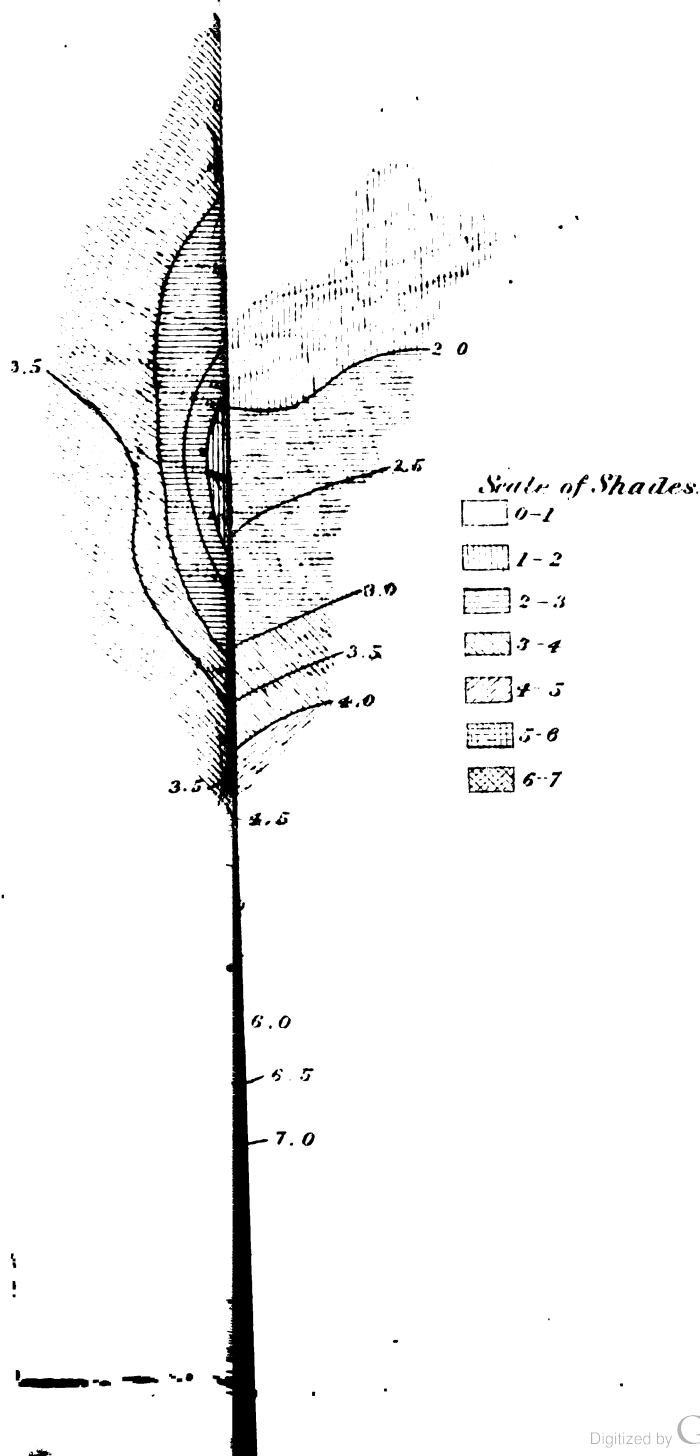
6-7

7-8



cubic foot of air.

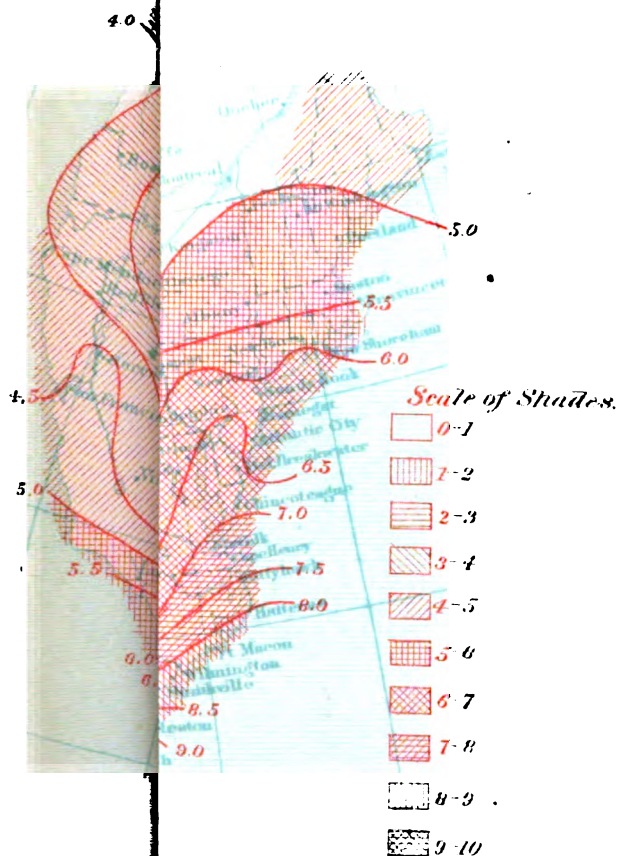
5



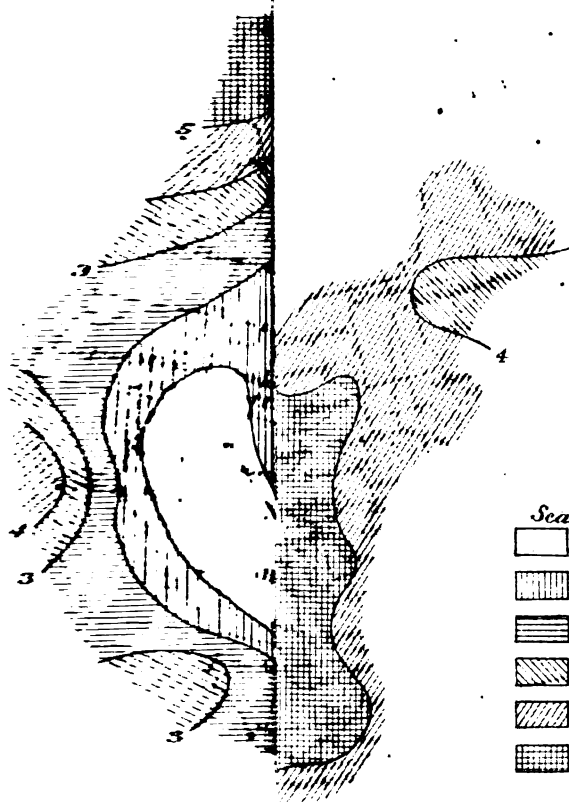


h cubic foot of air.

6

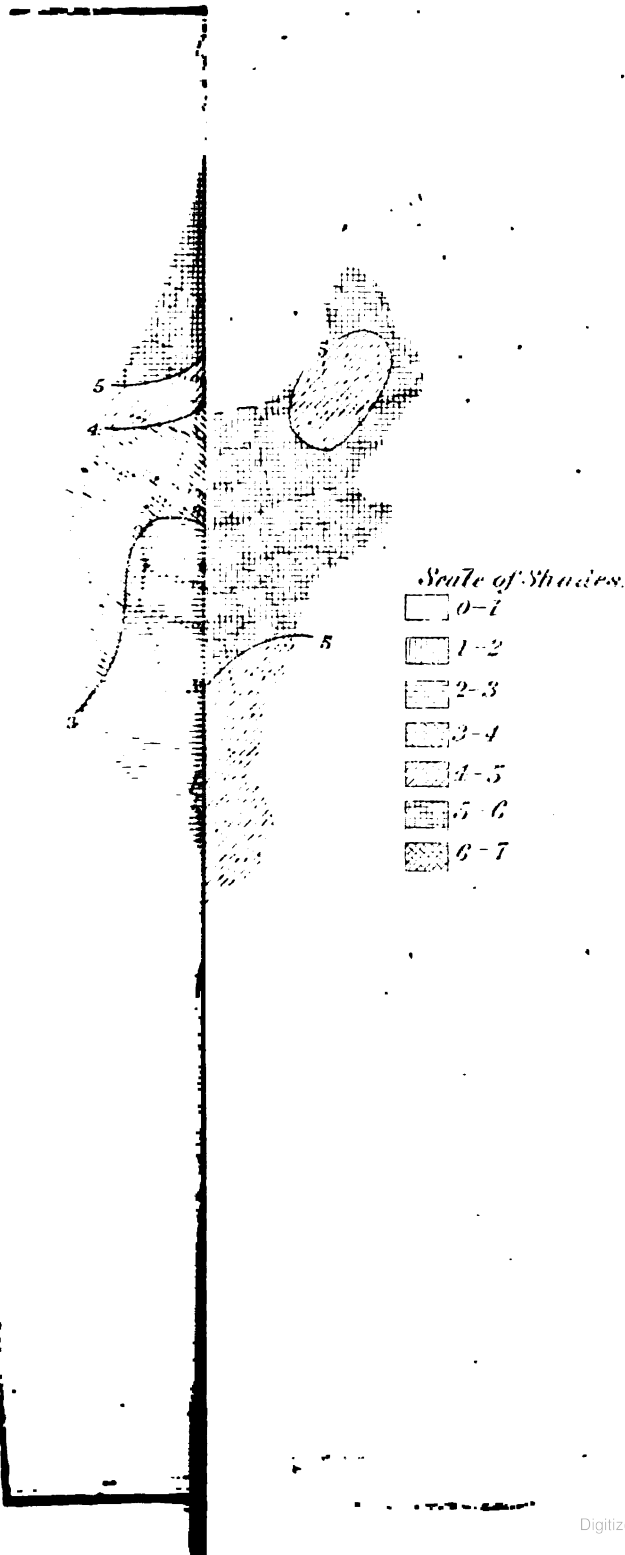




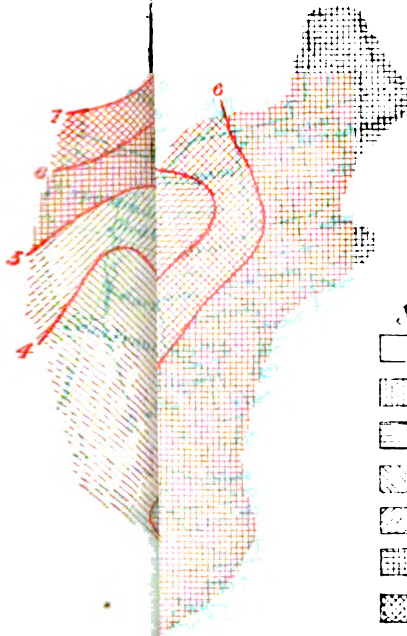




















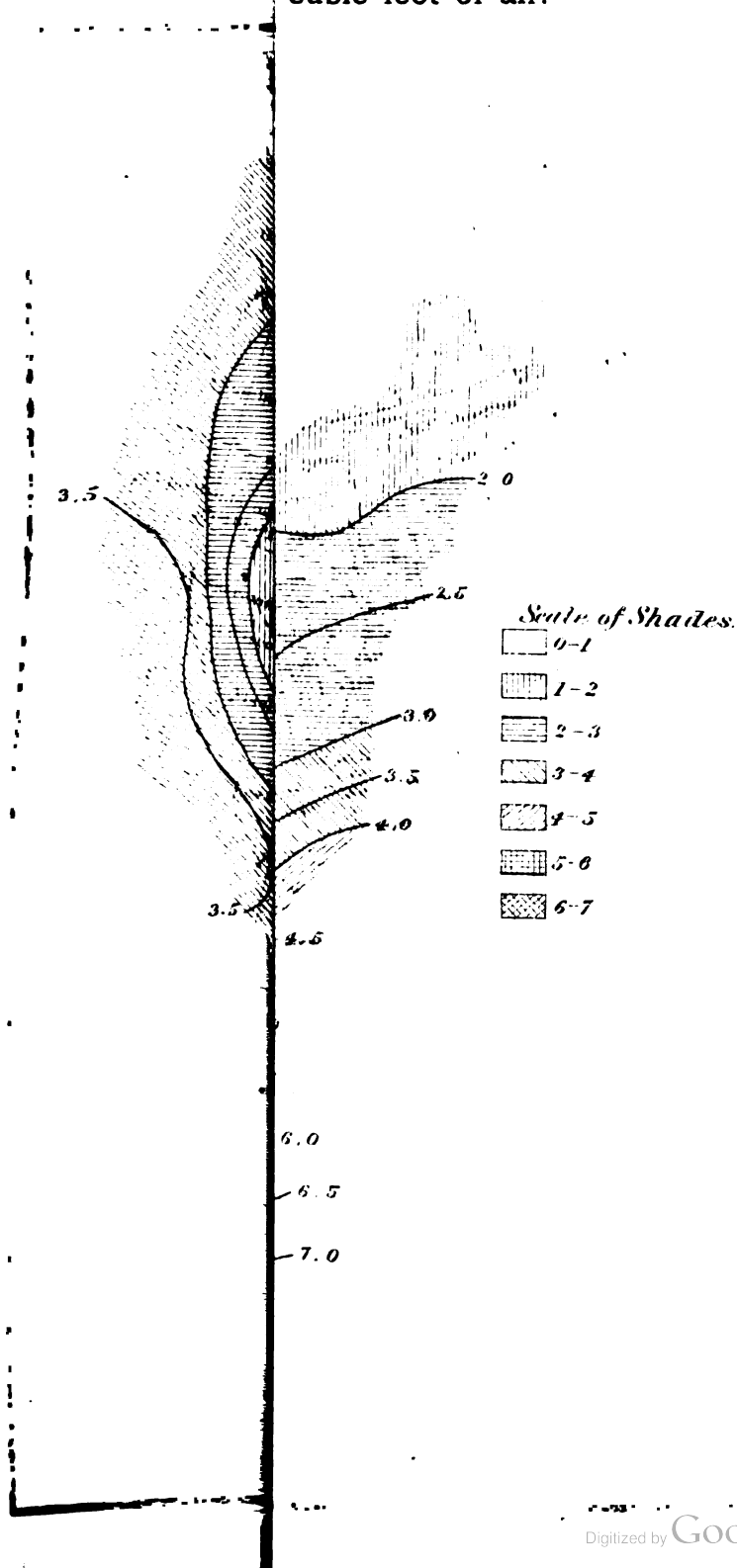
*Scale of Shading.*

	0-1
	1-2
	2-3
	3-4
	4-5
	5-6
	6-7
	7-8

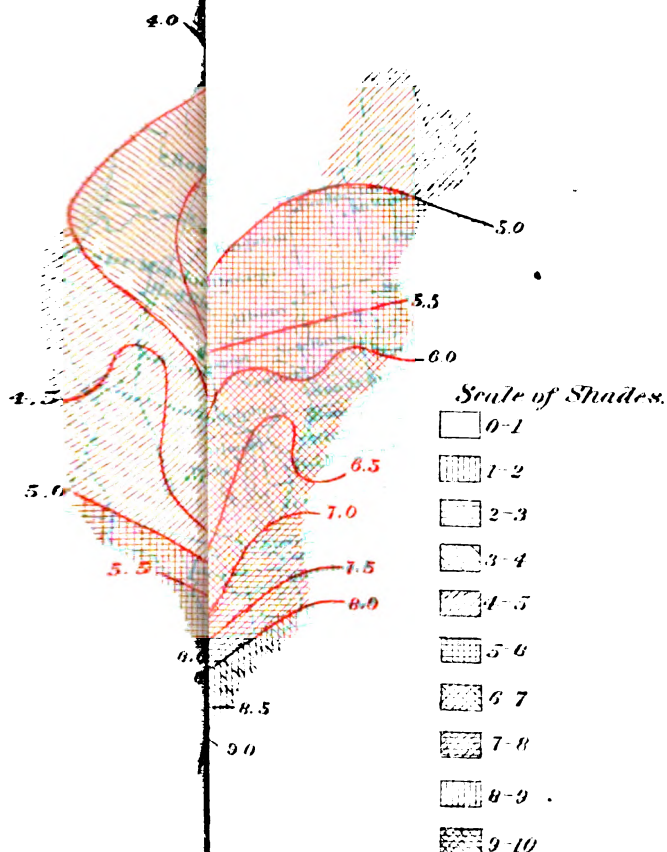


cubic foot of air.

5





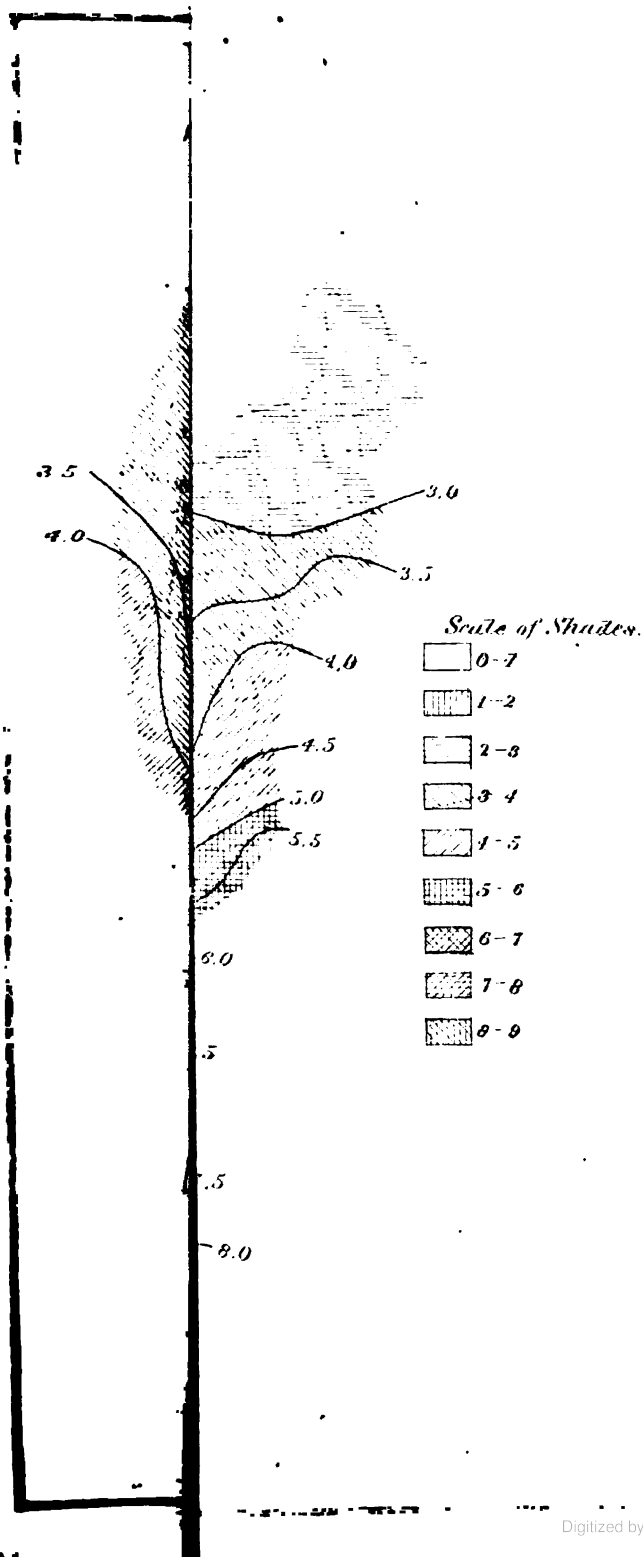






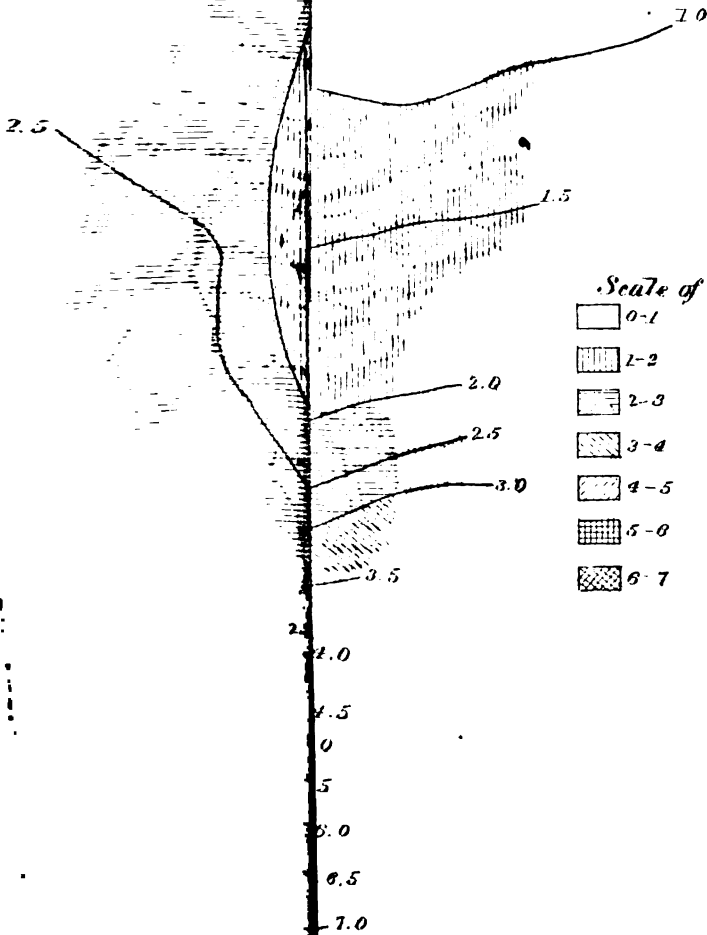
cubic foot of air.

7





cubic foot of air.





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Table showing the mean temperature, relative humidity, dew-point, cloudiness, maximum, minimum, and daily range of temperature, vapor tension, and absolute humidity, for each of the four seasons, at stations of the Signal Service, United States Army—Continued.

Stations.	Mean temperature.				Mean relative humidity.				Mean dew-point.				Mean vapor tension.				Mean absolute humidity.			
	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Albany, N. Y.	48.5	71.6	62.0	37.7	58.7	68.9	73.0	64.4	58.0	67.4	59.9	17.8	166	472	246	197	1.97	5.28	2.86	1.19
Alpena, Mich.	22.7	61.2	41.9	18.2	70.3	74.7	78.0	77.1	23.6	52.3	36.1	11.8	126	391	212	172	1.50	4.40	2.47	0.88
Apache, Fort, Ariz.	59.3	65.0	51.9	35.7	51.4	53.4	54.8	54.8	23.4	44.0	38.1	28.5	162	335	189	143	1.92	3.81	2.21	1.70
Ashtabula, Fort, Mont.	59.3	65.0	51.9	35.7	51.4	53.4	54.8	54.8	23.4	44.0	38.1	28.5	162	335	189	143	1.92	3.81	2.21	1.70
Atlanta, Ga.	59.3	65.0	51.9	35.7	51.4	53.4	54.8	54.8	23.4	44.0	38.1	28.5	162	335	189	143	1.92	3.81	2.21	1.70
Atlantic City, N. J.	48.7	70.2	63.2	44.4	68.3	77.7	82.9	74.0	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Austin, Tex.	62.9	80.8	68.5	59.3	68.3	78.6	83.4	78.4	48.9	68.1	56.6	43.8	342	687	457	280	3.87	7.49	5.10	3.23
Augusta, Ga.	51.8	74.8	65.9	48.4	68.0	77.7	82.9	74.0	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Baltimore, Md.	48.7	70.2	63.2	44.4	68.3	77.7	82.9	74.0	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Barre, Vt.	42.3	68.7	43.3	18.8	60.1	68.9	74.1	72.7	38.0	61.8	46.1	28.2	234	554	336	154	2.70	6.15	3.65	1.74
Barnesville, N. J.	42.1	67.7	43.3	18.8	60.1	68.9	74.1	72.7	38.0	61.8	46.1	28.2	234	554	336	154	2.70	6.15	3.65	1.74
Barnett, Fort, Dak.	42.1	67.7	43.3	18.8	60.1	68.9	74.1	72.7	38.0	61.8	46.1	28.2	234	554	336	154	2.70	6.15	3.65	1.74
Benton, Fort, Mont.	42.1	67.7	43.3	18.8	60.1	68.9	74.1	72.7	38.0	61.8	46.1	28.2	234	554	336	154	2.70	6.15	3.65	1.74
Bismarck, Dak.	37.6	66.9	41.0	15.3	57.0	68.9	73.0	62.6	32.0	46.2	31.6	2.2	131	286	178	141	1.67	4.54	2.08	0.69
Boise City, Idaho	42.6	67.2	43.3	18.8	60.1	68.9	74.1	72.7	38.0	61.8	46.1	28.2	234	554	336	154	2.70	6.15	3.65	1.74
Boston, Mass.	50.0	70.1	63.2	44.4	68.3	77.7	82.9	74.0	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Brownsville, Tex.	73.7	88.3	73.1	58.1	77.7	87.0	92.2	81.4	58.3	74.2	61.2	41.2	307	667	359	107	2.42	5.88	2.97	1.29
Buffalo, N. Y.	48.7	70.2	63.2	44.4	68.3	77.7	82.9	74.0	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Bulford, Fort, Dak.	37.6	66.9	41.0	15.3	57.0	68.9	73.0	62.6	32.0	46.2	31.6	2.2	131	286	178	141	1.67	4.54	2.08	0.69
Cairo, Ill.	53.2	75.0	62.0	40.6	73.7	76.2	77.2	77.2	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Capo May, N. J.	49.1	71.3	57.1	37.2	70.3	74.7	78.0	74.0	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Capo Mendocino, Cal.	48.6	68.9	54.2	46.0	68.2	78.6	83.4	78.4	46.8	64.8	51.8	27.9	217	602	378	224	3.61	6.68	4.80	2.66
Cedar Keys, Fla.	69.7	81.2	73.9	60.1	85.2	90.1	93.8	86.1	64.1	82.2	69.4	48.5	364	604	349	175	3.30	6.68	3.85	1.74
Charleston, N. C.	58.9	83.2	73.9	60.1	85.2	90.1	93.8	86.1	64.1	82.2	69.4	48.5	364	604	349	175	3.30	6.68	3.85	1.74
Charlotte, N. C.	58.9	83.2	73.9	60.1	85.2	90.1	93.8	86.1	64.1	82.2	69.4	48.5	364	604	349	175	3.30	6.68	3.85	1.74
Chattanooga, Tenn.	58.9	83.2	73.9	60.1	85.2	90.1	93.8	86.1	64.1	82.2	69.4	48.5	364	604	349	175	3.30	6.68	3.85	1.74
Cheyenne, Wyo.	48.0	67.8	60.8	42.1	61.8	72.4	77.2	77.2	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Chicago, Ill.	48.0	67.8	60.8	42.1	61.8	72.4	77.2	77.2	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Chino, Cal.	48.0	67.8	60.8	42.1	61.8	72.4	77.2	77.2	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Cincinnati, Ohio	52.6	74.5	67.9	38.7	76.8	81.8	80.1	78.8	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Cleveland, Ohio	42.3	68.8	51.9	25.6	67.4	76.8	81.8	78.8	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Columbus, Ohio	48.3	70.9	63.4	42.8	68.6	77.7	81.4	78.8	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99
Concho, Fort, Tex.	38.5	81.2	64.2	42.8	68.6	77.7	81.4	78.8	41.0	60.2	49.7	30.8	263	443	256	164	3.86	7.02	4.01	1.99

## REPORT OF THE CHIEF SIGNAL OFFICER.

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Table showing the mean temperature, relative humidity, dew-point, cloudiness, maximum, minimum, and daily range of temperature, vapor tension, and absolute humidity, for each of the four seasons, at stations of the Signal Service, United States Army—Continued.

Stations.	Mean temperature.				Mean relative humidity.				Mean dew-point.				Mean vapor tension.				Mean absolute humidity.			
	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
	°	°	°	°	%	%	%	%	°	°	°	°	°	°	°	°	g	g	g	g
	°	°	°	°	%	%	%	%	°	°	°	°	°	°	°	°	g	g	g	g
	°	°	°	°	%	%	%	%	°	°	°	°	°	°	°	°	g	g	g	g
New Orleans, La.	80.1	81.7	82.9	81.9	68.7	70.3	70.3	68.7	72.7	72.7	72.7	61.5	47.7	39.7	38.9	38.9	3.4	3.4	3.4	3.4
New York, N. Y.	48.1	51.5	53.9	57.9	69.7	69.9	69.9	69.7	57.4	57.4	57.4	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Norfolk, Va.	55.6	61.9	63.1	62.3	77.9	75.5	75.5	77.9	64.5	64.5	64.5	52.9	40.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
North Platte, Nebr.	45.8	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Olympia, Wash.	48.7	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Omaha, Nebr.	48.5	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Owango, N. Y.	39.7	46.1	49.7	55.5	70.0	71.7	71.7	70.0	53.2	53.2	53.2	40.7	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Palestine, Tex.	65.5	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1
Pensacola, Fla.	68.4	71.0	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6
Philadelphia, Pa.	50.0	61.1	65.7	68.1	73.2	73.2	73.2	73.2	60.7	60.7	60.7	48.9	40.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Pike's Peak, Colo.	14.9	32.4	40.1	46.1	53.9	53.9	53.9	53.9	40.2	40.2	40.2	27.0	27.0	27.0	27.0	27.0	2.4	2.4	2.4	2.4
Pioche, N. Mex.	44.7	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Pittsburg, Pa.	49.5	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Port Harb., Mich.	37.4	49.5	54.0	58.8	70.0	70.0	70.0	70.0	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Portland, Me.	49.8	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Portland, Ore.	53.8	64.0	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Prescott, Ariz.	50.0	61.1	65.7	68.1	73.2	73.2	73.2	73.2	60.7	60.7	60.7	48.9	40.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Providence, Mass.	41.9	51.5	53.9	57.9	69.7	69.9	69.9	69.7	57.4	57.4	57.4	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Red Bluff, Cal.	70.0	81.7	82.9	81.9	68.7	70.3	70.3	68.7	72.7	72.7	72.7	61.5	47.7	39.7	38.9	38.9	3.4	3.4	3.4	3.4
Rio Grande City, Tex.	53.2	64.0	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Rochester, N. Y.	50.0	61.1	65.7	68.1	73.2	73.2	73.2	73.2	60.7	60.7	60.7	48.9	40.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Roseburg, Ore.	53.2	64.0	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Saint Louis, Mo.	53.0	64.0	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Saint Paul, Minn.	40.6	51.5	53.9	57.9	69.7	69.9	69.9	69.7	57.4	57.4	57.4	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Saint Vincent, Minn.	39.7	46.1	49.7	55.5	70.0	71.7	71.7	70.0	53.2	53.2	53.2	40.7	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Salt Lake City, Utah	49.5	60.7	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
San Diego, Cal.	58.5	68.1	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6
Sandy Hook, N. J.	48.1	51.5	53.9	57.9	69.7	69.9	69.9	69.7	57.4	57.4	57.4	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
San Francisco, Cal.	54.8	64.0	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Savannah, Ga.	54.8	64.0	67.9	70.3	66.6	68.7	68.7	66.6	57.0	57.0	57.0	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4
Shaw, Fort, Mont.	40.6	51.5	53.9	57.9	69.7	69.9	69.9	69.7	57.4	57.4	57.4	43.4	37.7	30.7	29.1	29.1	2.4	2.4	2.4	2.4

[illegible]

# APPENDIX 10.

*List of voluntary observers who have forwarded monthly reports to the Chief Signal Officer during the year ending June 30, 1884.*

Name of observer.	Post-office.	County.	State or Territory.
Allen, Joseph H.	Elk Knob	Watauga	North Carolina.
Arden, Thomas B.	Garrison	Putnam	New York.
Adrianse, Charles E.	Hector	Schuyler	Do.
Altaffer, J. M.	Independence	Montgomery	Kansas.
Alden, Thomas E.	Kising Sun	Ohio	Indiana.
Andrews, Luman	Southington	Hartford	Connecticut.
Anderson, Dr. W. W.	Stateburg	Sumter	South Carolina.
Abbott, Dr. E. K.	Salinas City	Monterey	California.
Briggs, John	Albany	Linn	Oregon.
Bryant, J. M.	Andersonville	Sumter	Georgia.
Beloit College	Beloit	Rock	Wisconsin.
Dear, John P.	Charlestown	Suffolk	Massachusetts.
Baldwin, A. L.	Bethel	Fairfield	Connecticut.
Boggs, W. R.	Bryard	Transylvania	North Carolina.
Bacon, Ahira	Bristol	Crafton	New Hampshire.
Bennett, George	Randon	Coc	Oregon.
Bryant, A. F.	Clear Creek	Seunders	Nebraska.
Brady, Rev. S. H.	Clarkville	Red River	Texas.
Blanchard, O. A.	Elmira	Stark	Illinois.
Breed, J. E.	Embarras	Waupesa	Wisconsin.
Bell, Joseph	Franklin	Vanage	Pennsylvania.
Boots, Dr. S. S.	Greenfield	Hancock	Indiana.
Bennett, Dr. J. L.	Gunnison	Gunnison	Colorado.
Bowen, F. W.	Humboldt	Humboldt	Iowa.
Boles, A. H.	Hudson	Lenawee	Michigan.
Brainerd, Dr. H. G.	Independence	Buchanan	Iowa.
Baker, Dr. H. B.	Lansing	Ingham	Michigan.
Beall, Dr. R. L.	Lenoir	Caldwell	North Carolina.
Bullard, Ransom	Litchfield	Hillsdale	Michigan.
Beans, Thomas J.	Moorestown	Burlington	New Jersey.
Blachly, C. P.	Manhattan	Biley	Kansas.
Beebe, Arthur	Manistique	Schoolcraft	Michigan.
Bardsley, James G.	Nephi	Utah	Utah.
Beecher, Charles	Saint Mark's	Wakulla	Florida.
Boyd, Joseph	Oskaloosa	Mahaska	Iowa.
Baker, Dr. J. L.	Ottumwa	Wapello	Do.
Brendel, Fred	Peoria	Peoria	Illinois.
Bentley, David	Princeton	Colusa	California.
Becker, Rev. William	Prairie Du Chien	Crawford	Wisconsin.
Buck, Miss F. E.	Red Willow	Red Willow	Nebraska.
Buck, Mrs. Royal	do	do	Do.
Bowman, Peter	Savannah	Ashland	Ohio.
Belville, Penton	Saint George's	New Castle	Delaware.
Bailou, Dr. N. E.	Sandwich	De Kalb	Illinois.
Boynton, J. F.	Syracuse	Onondaga	New York.
Boerner, Prof. Charles G.	Vevay	Switzerland	Indiana.
Bartlett, E. B.	Vermilion	Oswego	New York.
Betta, Prof. Arthur	Webster	Day	Dakota.
Calhoun, P. B.	Austin	Wilson	Tennessee.
Carman, Charles W.	Ann Arbor	Washtenaw	Michigan.
Case, John J.	Allison	Decatur	Kansas.
Casey, George	Anburn	Cayuga	New York.
Charbonnier, Prof. L. H.	Athens	Clarke	Georgia.
Crump, M. H.	Bowling Green	Warren	Kentucky.
Cochran, William P.	Clay Centre	Clay	Kansas.
Culver, G. E.	Vermilion	Clay	Dakota.
Cooch, E. D.	Centocook	Merrimack	New Hampshire.
Currie, Nell	Currie	Murray	Minnesota.
Cole, Seward	Los Angeles	Los Angeles	California.
Coffin, Prof. S. J.	Easton	Northampton	Pennsylvania.
Curtiss, G. G.	Fallston	Harford	Maryland.
Conrad, Prof. O. F.	Fayetteville	Washington	Arkansas.

*List of voluntary observers who have forwarded monthly reports, &c.—Continued.*

Name of observer.	Post-office.	County.	State or Territory.
Cutler, B. B.	Heath	Franklin	Massachusetts.
Chase, Pliny E.	Haverford College	Montgomery	Pennsylvania.
Chapin, A. B.	Hastings	Dakota	Minnesota.
Cotton, Prof. G. H.	Hiram	Portage	Ohio.
Cooke, A. R.	Indianola	Warren	Iowa.
Cornell University	Ithaca	Tompkins	New York.
Cutting, Hiram A.	Lunenburg	Essex	Vermont.
Crosier, Adam	Laconia	Harrison	Indiana.
Crawford, D. F. G.	Allegheny	Allegheny	Pennsylvania.
Carpenter, Dr. William B.	Leavenworth	Leavenworth	Kansas.
Crawford, E. A.	Liberty Hill	Blenville	Louisiana.
Cheney, William	Minneapolis	Hennepin	Minnesota.
Clayton, H. H.	Murfreesborough	Rutherford	Tennessee.
Collin, Prof. Alonzo	Mount Vernon	Linn	Iowa.
Cook, S. A.	Milledgeville	Baldwin	Georgia.
Carlton College	Northfield	Rice	Minnesota.
Cott, H. H.	Nora Springs	Floyd	Iowa.
Chapin, Adams	Poway	San Diego	California.
Cotton, Dr. D. B.	Portsmouth	Scioto	Ohio.
Cutler, J. L.	Quitman	Brooks	Georgia.
Chandler, Charles H.	Ripon	Fond du Lac	Wisconsin.
Chandler, Dr. W. J.	South Orange	Essex	New Jersey.
Caulkins, John S.	Thornville	Lapeer	Michigan.
Carter, Rev. Dr. W. H.	Tallahassee	Leon	Florida.
Clark, T. A.	Weldon	Hallfax	North Carolina.
Clark, A. C.	Wausau	Marathon	Wisconsin.
Comstock, Prof. F. M.	Le Roy	Genesee	New York.
Dowds, Edward C.	Alexandria	Hanson	Dakota.
Day, Theodore	Dyberry	Wayne	Pennsylvania.
Danton, Lient. W. R.	Dorset	Bennington	Vermont.
Dickinson, Jas. P.	Guttenberg	Clayton	Iowa.
Dixon, Geo.	Hampton	Elizabeth City	Virginia.
Dunker, A. H.	Los Angeles	Los Angeles	California.
Diffenderfer, Wm. I.	Lebanon	Laclede	Missouri.
Drake, W. T.	Marshall	Calhoun	Michigan.
Dodder, William	Mattoon	Coles	Illinois.
Davis, Jacob	Rowe	Franklin	Massachusetts.
Dawson, William	Spiceland	Henry	Indiana.
Dunbar, K. E.	South Bend	Saint Joseph	Do.
Dow, Roswell	Sycamore	De Kalb	Illinois.
Deckhart, William H.	Tamaqua	Schuylkill	Pennsylvania.
Dewhurst, Rev. E.	Voluntown	New London	Connecticut.
Dutton, Hosea	Woodstock	Windor	Vermont.
Deming, Hiram D.	Wellsborough	Tioga	Pennsylvania.
Darweiler, Philip	West Bend	Palo Alto	Iowa.
Eckstein, Rev. M.	Conception	Nodaway	Missouri.
Ellsworth, W. W.	Hartford	Hartford	Connecticut.
Ellis, John	Marquette	Hamilton	Nebraska.
Elmott, J. C.	Swanwick	Perry	Illinois.
Elison, W. A.	Statesville	Iredell	North Carolina.
Fulton, W. L.	Brunswick	Glynn	Georgia.
Friend, Charles W.	Carson City	Ormsby	Nevada.
Fisch, Dr. A.	College City	Colusa	California.
Fonda, W. A.	Carroll	Carroll	Iowa.
Fox, F. E.	Fall Brook	San Diego	California.
Fair, J. E.	Harrisville	Aloona	Michigan.
Fox, E. T.	Hydesville	Humboldt	California.
Fußer, Prof. G. H.	Manhattan	Riley	Kansas.
Faller, E. N.	New Tacoma	Pierce	Washington.
Fernald, Prof. M. C.	Orono	Penobscot	Maine.
Ferguson, W.	Patterson	Pasalic	New Jersey.
Fleming, John	Readington	Hunterdon	Do.
Ferguson, Allan	Sandy Springs	Montgomery	Maryland.
Ford, B. F.	Sunman	Ripley	Indiana.
Fitch, Prof. J. H.	Warrenton	Warren	Missouri.
Furtessene, J.	York Factory		British America.
Gillingham, W.	Acoctink	Fairfax	Virginia.
Goldinga, Dr. W. H.	Aiken	Aiken	South Carolina.
Gray, Capt. A. W.	Ainsworth	Franklin	Washington.
Gustafson, John	Bloomington	Pike	Pennsylvania.
Gunn, W. B.	Burlington	Chittenden	Vermont.
Gillingham, M.	Fallington	Bucks	Pennsylvania.
Gardner, Robert H.	Gardiner	Kennebec	Maine.
Giles, George J.	Grand Turk		British West Indies.
Govey, H. D.	North Lewisburg	Champaign	Ohio.
Gunn, John H.	Salina	Saline	Kansas.
Gorish, S. H.	Sacramento	Sacramento	California.
Gray, J. W.	Stockham	Hamilton	Nebraska.
Graham, Dr. George G.	Swartz Creek	Genesee	Michigan.
Gentry, J. W.	Sherlock	Finney	Kansas.
Gunn, Dr. J. C.	West Chester	Chester	Pennsylvania.

*List of volunteer observers who have forwarded monthly reports, &c.—Continued.*

Name of observer.	Post-office.	County.	State or Territory.
Goodwin, Miss E	Wytheville	Wythe	Virginia.
Gray, F. B.	Yates Centre	Woodson	Kansas.
Hurlin, Rev. William	Antrim	Hillsborough	New Hampshire.
Horn, Dr. H. B.	Atchison	Atchison	Kansas.
Hoskinson, R. M.	Blakely	Kitsap	Washington.
Harvard College Observatory	Cambridge	Middlesex	Massachusetts.
Hammett, J. W.	College Hill	Hamilton	Ohio.
Hyde, G. A.	Cleveland	Cuyahoga	Do.
Harper, George W.	Cincinnati	Hamilton	Do.
Haasler, B. K.	Chambersburg	Franklin	Pennsylvania.
Harrison, R. A.	Caldwell	Essex	New Jersey.
Hoyt, Fred. C.	Easton	Northampton	Pennsylvania.
Heaton, Isaac E.	Fremont	Dodge	Nebraska.
Hill, William	Flemington	Hunterdon	New Jersey.
Hall, R. M.	Feagin	Houston	Georgia.
Helm, Thomas B.	Logansport	Cass	Indiana.
Hurley, John M.	Lancaster	Grant	Wisconsin.
Hagensick, C. W.	Lincoln	Lancaster	Nebraska.
Holden, Prof. E. S.	Madison	Dane	Wisconsin.
Hartzler, J. A.	Mottville	Saint Joseph	Michigan.
Hilton, John B.	Patterson	Passaic	New Jersey.
Hering, Dr. C. J.	Paramaribo	San Francisco	South America.
Hyslop, John	San Francisco	San Francisco	California.
Heacock, J. L.	Quakertown	Bucks	Pennsylvania.
Hooker, P. J.	Rapid City	Pennington	Dakota.
Harris, Thomas C.	Raleigh	Wake	North Carolina.
Howe, Prof. J. L.	Richmond	Madison	Kentucky.
Howe, Edmund D.	Table Rock	Pawnee	Nebraska.
Hazen, L. S.	Terre Haute	Vigo	Indiana.
Hills, Frank T.	Vineland	Cumberland	New Jersey.
Hunter, Dr. T. C.	Wabash	Wabash	Indiana.
Haywood, John	Westerville	Franklin	Ohio.
Hall, J. B.	Worcester	Worcester	Massachusetts.
Hodge, Rev. F. B.	Wilkes Barre	Luzerne	Pennsylvania.
Haller, Misses M. and J.	Wytheville	Wythe	Virginia.
Heath, Dr. E. R.	Wyandotte	Wyandotte	Kansas.
Houghton farm experimental station.	Mountainville	Orange	New York.
Iowa Agricultural College	Ames	Story	Iowa.
Ingram, Dr. J.	Vineland	Cumberland	New Jersey.
Johnson, T. N.	Canal Dover	Tuscarawas	Ohio.
Jackson, E. E.	Columbia	Richland	South Carolina.
James, John W.	Marengo	McHenry	Illinois.
Jordan, Dr. M. D. L.	Milan	Gibson	Tennessee.
Josephs, W. B.	New Market	Rockingham	New Hampshire.
Jones, Ira B.	Nellisville	Clark	Wisconsin.
Jones, F. M.	Puerto de Luna	San Miguel	New Mexico.
Jones, Dr. E. U.	Taunton	Bristol	Massachusetts.
Jackman, John W.	Utica	Seward	Nebraska.
Keese, G. P.	Cooperstown	Otsego	New York.
Kauffman, H. W.	Dillingersville	Lehigh	Pennsylvania.
Kuhne, F. W.	Fort Wayne	Allen	Indiana.
Kimball, P. R.	Grafton	Grafton	New Hampshire.
Kirkwood, E.	Glenwood	Rush	Indiana.
Kendall, J. S.	Honey Grove	Fannin	Texas.
Knight, G. W.	Inavale	Webster	Nebraska.
Kenmuir, J. P.	Kansas City	Jackson	Missouri.
Knapp, J. G.	Limona	Hillsborough	Florida.
Keeler, W. F.	Mayport	Duval	Do.
Kent, J. C. and Miss E.	Phillipsburg	Warren	New Jersey.
Kellogg, J. H.	Battle Creek	Calhoun	Michigan.
Loomis, John C.	Jeffersonville	Clark	Indiana.
Lupea, Misses C., E. and J.	Manitowoc	Manitowoc	Wisconsin.
Lincoln, A. T.	Marion	Smyth	Virginia.
Lay, Dr. James C.	Pueblo	Pueblo	Colorado.
Lovewell, Miss B. E.	Topeka	Shawnee	Kansas.
Luther, S. M.	Garrettsville	Portage	Ohio.
Mell, Prof. P. H., jr.	Auburn	Lee	Alabama.
Marshall, Gregory	Cresco	Howard	Iowa.
Miller, H. D.	Drifton	Luzerne	Pennsylvania.
Montfort, B. de	Dannemora	Clinton	New York.
Mount Saint Mary's College	Emmitsburg	Frederick	Maryland.
McCready, Miss L. A.	Fort Madison	Lee	Iowa.
Meehan, Thomas	Germantown	Philadelphia	Pennsylvania.
Moore, Nathan	Gramplan Hills	Clearfield	Do.
McClintock, Frank	Grand Junction	Mesa	Colorado.
Moore, C. R.	Johnsontown	Northampton	Virginia.
Munn, A.	Kalamazoo	Kalamazoo	Michigan.
McDonogh Institute	McDonogh	Baltimore	Maryland.
Maxwell, S. A.	Morrison	Whiteside	Illinois.
Metcalf, Dr. John G.	Mendon	Worcester	Massachusetts.

*List of volunteer observers who have forwarded monthly reports, &c.—Continued.*

Name of observer.	Post-office.	County.	State or Territory.
Morris, Rev. John	Morrison	Davison	Dakota.
Martin, Horace	Stella	Richardson	Nebraska.
Mar, W. W.	Salem	Washington	Indiana.
McPherson, William	San Rafael	Marin	California.
Micklem, J. H.	Variety Mills	Nelson	Virginia.
Mikessell, Thomas	Wauseon	Fulton	Ohio.
McKenzie, Miss M. L.	Peru	Nemaha	Nebraska.
Newbegin, J. D.	Anna	Union	Illinois.
Neal, Dr. James C.	Archer	Alachua	Florida.
Neely, T. S.	Barnesville	Johnson	Texas.
Nickerson, W. W.	Klamath Agency	Lake	Oregon.
Nelson, Dr. William H.	Northport	Leelanaw	Michigan.
Nordberg, Adolph	Richardton	Stark	Dakota.
Neill, Thomas	Sandusky	Erie	Ohio.
Nell, A. B.	Somerville	Somerset	New Jersey.
Newcomb, G. S.	Westborough	Worcester	Massachusetts.
Nease, H. D.	Washington		District of Columbia.
Neenan, George E.	Weaverville	Trinity	California.
Nichols Academy	Dudley	Worcester	Massachusetts.
Gaborn, Dr. Thomas C.	Cleburne	Johnson	Texas.
O'Brien, James F.	Devil's Lake	Ramsey	Dakota.
Owley, Dr. J. B.	Jacksonborough	Butler	Ohio.
Otis, H. G.	Lime Rock	Jackson	Alabama.
Osmond, Prof. I. T.	State College	Centre	Pennsylvania.
Pearce, Thomas	Eola	Polk	Oregon.
Phillips, W. R.	Evansville	Rock	Wisconsin.
Parriah, George W.	Ellensburg	Yakima	Washington.
Parmelee, Francis D.	Hillsdale	Hillsdale	Michigan.
Parmer, Charles S.	Ithaca	Tompkins	New York.
Pearson, Rev. J.	Ionia	Ionia	Michigan.
Parsons University	La Fayette	Tippecanoe	Indiana.
Parks, C. M.	Logan	Cache	Utah.
Patrick, J. M.	North Volney	Oswego	New York.
Parmelee, J. B.	Nebraska City	Otoe	Nebraska.
Powrie, W.	Sussex	Waukesha	Wisconsin.
Patterson, William	Salem	Salem	New Jersey.
Quarterman, Fred	Flushing	Queens	New York.
Quilaco, Fiacro	Mazatlan		Mexico.
Robertson, P. D.	Bodford	Livingston	Missouri.
Rash, Fred	Clinton	Vermillion	Indiana.
Revera, Dr. James S.	East Tawas	Iosco	Michigan.
Richardson, Charles F.	Freehold	Monmouth	New Jersey.
Remington, C. V. S.	Fall River	Bristol	Massachusetts.
Ross, Orpha E.	Highlands	Macon	North Carolina.
Riggs, John P.	Larchland	Warren	Illinois.
Rogers, F. M.	Luling	Saint Charles	Louisiana.
Rosenberger, Dr. E. H.	Marion	Marion	Ohio.
Rogers, Jesse D.	Nile	Allegheny	Ohio.
Runge, C.	New Utm.	Austin	New York.
Rudman, Thomas R.	New Bedford	Bristol	Texas.
Ross, F. W.	Newark	Bristol	Massachusetts.
Ross, W. J.	Newark	Essex	New Jersey.
Backwood, Prof. C. G.	Pretty Prairie	Reno	Kansas.
Robertson, T. D.	Princeton	Marcer	New Jersey.
Robinson, W. F.	Rockford	Winnebago	Illinois.
Richardson, Dr. E. S.	Sanolph	Orange	Vermont.
Russell, George W.	Reed City	Osceola	Michigan.
Rosk, Col. B. E.	Wellsburg	Brooke	West Virginia.
Snell, Miss S. C.	Bordentown	Burlington	New Jersey.
Sancosta, Oscar	Amherst	Hampshire	Massachusetts.
Sherren, S.	Austin	Travis	Texas.
Spencer, G. H.	Belvidere	Warren	New Jersey.
Shriver, E. T.	Blackburg	Montgomery	Virginia.
State Public School	Cumberland	Allegheny	Maryland.
Swezey, Goodwin D.	Coldwater	Branch	Michigan.
Silver, M. B.	Crete	Saline	Nebraska.
Shaw, J.	Coal Harbor		British Columbia.
Shaw, Charles	Chester	Olmstead	Minnesota.
Sidler, Prof. H. E.	De Soto	Washington	Nebraska.
Shaban, Charles O.	Emporia	Lyon	Kansas.
Scott, Thomas G.	Edgington	Rock Island	Illinois.
State Agricultural College	Forayth	Monroe	Georgia.
Stenecker, H. W. E.	Fort Collins	Larimer	Colorado.
Sweet, Fred	Franklin	Sheboygan	Wisconsin.
State School of Mines	Grand Rapids	Kent	Michigan.
Stacky, Dr. C. T.	Golden	Jefferson	Colorado.
Stann, Jacob T.	Helvetia	Randolph	West Virginia.
Stow, Prof. F. H.	Logan	Harrison	Iowa.
Smith, Henry D.	Lawrence	Douglas	Kansas.
Shepard, C. W.	Monticello	Jones	Iowa.
Sherman, W. B.	Mendon	Saint Joseph	Michigan.
	Manchester	Delaware	Iowa.

*List of volunteer observers who have forwarded monthly reports, &c.—Continued.*

Name of observer.	Post-office.	County.	State or Territory.
Shaw, E.	Mand.	Kingman	Kansas.
Spilman, J. J.	Pierce City	Lawrence	Missouri.
Sweeney, A. B.	Polo	Ogle	Illinois.
Slade, Eliaba	Somerset	Bristol	Massachusetts.
Slenker, Mrs. E. D.	Snowville	Pulaski	Virginia.
Scribner, H. F. J.	Stratford	Orange	Vermont.
Shepard, E. M.	Springfield	Greene	Missouri.
Smith, Rev. D. W.	Troy	Bradford	Pennsylvania.
Shriver, Howard	Wytheville	Wythe	Virginia.
Tillinghaast, C. B.	Albany	Albany	New York.
Todd, Prof. D. P.	Amherst	Hampshire	Massachusetts.
Teale, Rev. A. K.	Blue Hill	Norfolk	Do.
Truman, George S.	Genoa	Nance	Nebraska.
Tutwiler, L. D. H.	Green Springs	Hale	Alabama.
Townsend, L. P.	Hulmeville	Bucks	Pennsylvania.
Thommen, Gustave	Millville Depot	Pike	Do.
Trembley, Dr. J. B.	Oakland	Alameda	California.
Turnbo, Silas C.	Protem	Taney	Missouri.
Turner, Ernest	Point Pleasant	Texas	Louisiana.
Tebbetts, G. P.	Santa Barbara	Santa Barbara	California.
Upton, Prof. W.	Providence	Providence	Rhode Island.
Vermillion, W. W.	Curryville	Pike	Missouri.
Venable, Prof. F. P.	Chapel Hill	Orange	North Carolina.
Voegelt, Adolphus	Des Moines	Polk	Iowa.
Van Inwegen, Charles F.	Port Jervis	Orange	New York.
Williams College Observatory	Williamstown	Berkshire	Massachusetts.
Williams, Rev. C. F.	Hoffman	Maury	Tennessee.
Wing, Miss M. E.	Charlotte	Chittenden	Vermont.
West, Silas	Cornish	York	Maine.
Wilson, W. E.	Cedar Rapids	Linn	Iowa.
Wadsworth, Dr. J. L. R.	Collinsville	Madison	Illinois.
Williams, Dr. A. C.	Elk Falls	Elk	Kansas.
Wigg, Dr. George	East Portland	Multnomah	Oregon.
Watson, Evan	Fort Scott	Bourbon	Kansas.
Went, E. C.	Frankfort	Franklin	Kentucky.
Widman, Rev. O. M.	Grand Coteau	Saint Landry	Louisiana.
Whitney, Charles E.	Humphrey	Cattaraugus	New York.
Williamson, J. A.	Johnstown	Fulton	Do.
Wright, W. F.	Johnson	Nemaha	Nebraska.
Woodworth, C. E.	Kiantone	Chautauque	New York.
Wylie, William	Mount Forest	Canada	Canada.
Whittington, G.	Mount Ida	Montgomery	Arkansas.
Walton, J. P.	Muscotine	Muscotine	Iowa.
Woods, Mrs. Dr. A. G.	Maynard	Fayette	Do.
Wild, Rev. E. P.	Newport	Orleans	Vermont.
Walter, Frank	Ore Knob	Ashe	North Carolina.
Whitcomb, Dr. G. G.	Ogreets	Cherokee	Do.
West, Dr. Joseph O.	Princeton	Worcester	Massachusetts.
Westerfield, J. H.	Springfield	Conway	Arkansas.
Wait, S. E.	Traverse City	Grand Traverse	Michigan.
Woodstock College	Woodstock	Howard	Maryland.
Willis, Prof. O. E.	White Plains	Westchester	New York.
Wolfe, John H.	Willington	Sumner	Kansas.
Washington Aqueduct	Receiving reservoir		District of Columbia.
	Distributing reservoir		
	Rock Creek		Maryland.
	Great Falls		
	Lake Village	Belknap	New Hampshire.
	Weir's Bridge	do	
	Bristol	Grafton	
	Ashland	do	
	Woodstock	do	
	Belmont	Belknap	
	Wolfeborough	Carroll	
Watters, Dr. James	Westmoreland	Patawatonic	Kansas.
Wetmore, E. L.	Tucson	Pima	Arizona.
Yetter, William G.	Catawissa	Columbia	Pennsylvania.
Yates, T. P.	Factoryville	Tioga	New York.
Young, George R.	Penn Yan	Yates	Do.
Young, A. J.	Park City	Yellowstone	Montana.
Zimmerman, F. C.	Bunker Hill	Macoupin	Illinois.
Zimmermann, I. R.	Wentworth	Lake	Dakota.

## APPENDIX II.

*List of military posts from which monthly meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1884.*

Post.	State or Territory.	Post.	State or Territory.
Abraham Lincoln, Fort.....	Dakota.	McHenry, Fort.....	Maryland.
Alcatraz Island.....	California.	Mojave, Fort.....	Arizona.
Angel Island.....	do.	Monroe, Fort.....	Virginia.
Assinaboine, Fort.....	Montana.	Meade, Fort.....	Dakota.
Barrancas, Fort.....	Florida.	Mount Vernon Barracks..	Alabama.
Benicia Barracks.....	California.	Mason, Fort.....	California.
Brady, Fort.....	Michigan.	Mitchell, Camp.....	Georgia.
Bowie, Fort.....	Arizona.	Niagara, Fort.....	New York.
Bidwell, Fort.....	California.	Niobrara, Fort.....	Nebraska.
Buford, Fort.....	Dakota.	Pembina, Fort.....	Dakota.
Bridger, Fort.....	Wyoming.	Plattsburg Barracks.....	New York.
Canby, Fort.....	Washington.	Preble, Fort.....	Maine.
Columbus, Fort.....	New York.	Presidio of San Francisco..	California.
Comcho, Fort.....	Texas.	Poplar River, Camp.....	Montana.
David's Island.....	New York.	Randall, Fort.....	Dakota.
Ellis, Fort.....	Montana.	Reno, Fort.....	Indian Territory.
Fred Steele, Fort.....	Wyoming.	Robinson, Fort.....	Nebraska.
Gariand, Fort.....	Colorado.	Shaw, Fort.....	Nebraska.
Gaston, Fort.....	California.	Sisseton, Fort.....	Dakota.
Hale, Fort.....	Dakota.	Snelling, Fort.....	Minnesota.
Hamilton, Fort.....	New York.	Saint Francis Barracks....	Florida.
Jefferson Barracks.....	Missouri.	Sully, Fort.....	Dakota.
Keogh, Fort.....	Montana.	Spokane, Fort.....	Washington.
Klamath, Fort.....	Oregon.	Totten, Fort.....	Dakota.
Lapwai, Fort.....	Idaho.	Townsend, Fort.....	Washington.
Leavenworth, Fort.....	Kansas.	Union, Fort.....	New Mexico.
Lowell, Fort.....	Arizona.	West Point.....	New York.
Lyon, Fort.....	Colorado.	Warren, Fort.....	Massachusetts.
Lewis, Fort.....	do.	Wingate, Fort.....	New Mexico.
Madison Barracks.....	New York.	Washakie, Fort.....	Wyoming.
McDermitt, Fort.....	Nevada.	Yates, Fort.....	Dakota.
McDowell, Fort.....	Arizona.		



## APPENDIX 12.

### *INTERNATIONAL BULLETIN, CONTRIBUTORS TO DURING THE FISCAL YEAR ENDING JUNE 30, 1884.*

In the execution of this important work, I have to acknowledge the valuable co-operation of the chiefs of the meteorological services of the different countries represented as follows:

Algeria and Tunis, by Brigadier General Béziat, commandant supérieur du génie in Algeria, and from January, 1884, by M. Thévenet, director of the meteorological service at the college of science of Algeria; Australia, by R. L. J. Ellery, director of the observatory at Melbourne, New South Wales; Austro-Hungary, by Prof. Dr. Julius Hann, director of the imperial and royal central meteorological institute at Vienna; Belgium, by J. C. Houzeau, director of the royal observatory at Brussels; Great Britain, by the meteorological council, London, Robert H. Scott, esq., F. R. S., secretary; Canada, by Charles Carpmael, A. M., F. R. A. S., director of the magnetic observatory at Toronto, and superintendent of the meteorological office of the Dominion of Canada; Cape Colony, by the meteorological commission of Cape Colony at Cape Town; Chili, by the authority of the secretary of public instruction, through Francisco Vidal Gomáz, president of the central meteorological office at Santiago; China, by Marc Dechevrens, S. J., director of the meteorological observatory at Zi Ka Wei; Denmark, by Captain N. Hoffmeyer, director of the royal Danish meteorological institute at Copenhagen; Egypt, by Albert Ismailun, director of the laboratoire Khédivial du Caire; France, by Prof. E. Mascart, director of the central meteorological office of France; Germany, by Prof. Dr. G. Neumayer, director of the German marine observatory at Hamburg; Greece, by Prof. Dr. Julius Schmidt, director of the royal observatory at Athens, to February 1, 1884, when he was succeeded by D. K. Kokkidès; India, by H. F. Blanford, meteorological reporter to the Government of India at Calcutta; Italy, by His Excellency the minister of agriculture, industry and commerce, through Prof. P. Tacchini, director of the central meteorological office at Rome; Japan, by I. Arai, director of the imperial meteorological observatory at Tokel; Mauritius, by C. Meldrum, secretary of the meteorological society of Mauritius; Mexico, by authority of the secretary of public works, through Señor Mariano Bárcena, director of the central meteorological observatory at Mexico; the Netherlands, by Prof. Buys Ballot, director of the royal meteorological institute of the Netherlands, at Utrecht; Norway, by Prof. H. Mohn, director of the royal Norwegian meteorological institute at Christiania; Portugal, by J. C. de Brito Capello, director of the meteorological observatory of the Infante Dom Luiz at Lisbon; Russia, by Prof. H. Wild, director of the imperial central physical observatory of Russia at St. Petersburg; Scotland, by Alexander Buchan, M. A., F. R. S. E., secretary of the Scottish meteorological society at Edinburgh; Spain, by Antonio Aguilar, director of the royal observatory at Madrid; Sweden, by Prof. R. Rubenson, director of the royal Swedish meteorological institute at Stockholm, and by Prof. H. H. Hildebrandson, director of the meteorological observatory at Upsala; Switzerland, by Prof. E. Plantamour, director of the observatory at Geneva; Turkey, by A. Couribary, Effendi, director of the central observatory at Constantinople, and F. Nimir, B. A., director of the Lee observatory (Syrian Protestant College) at Beirut; United States of Columbia, by Ensign R. K. Wright, U. S. Navy, in behalf of the General Inter-oceanic Canal Company, and the respective observers of each series.

The British naval series, furnished by the co-operation of the meteorological council, London, Robert H. Scott, Esq., F. R. S., secretary; Portuguese Navy, by J. C. de Brito Capello, director of the meteorological observatory of the Infante Dom Luiz at Lisbon; Swedish Navy, through E. Malmberg, director of the nautical meteorological bureau of Stockholm; United States Navy, by the honorable the Secretary of

the Navy, through Commodore John G. Walker, U. S. N., chief of the Bureau of Navigation.

Series.	Number of stations reporting.	Series.	Number of stations reporting.
Algerian .....	11	Norwegian .....	5
Australian .....	3	Portuguese .....	8
Austro-Hungarian .....	13	Russian .....	43
Belgian .....	4	Scottish .....	2
British .....	32	Spanish .....	12
Canadian .....	42	Swedish .....	6
Cape Colony .....	3	Swiss .....	1
Chilian .....	7	Turkish .....	4
Chinese .....	4	United States of Colombia .....	2
Danish .....	9	United States sub-series .....	16
Egyptian .....	1		
French .....	46	Total foreign stations reporting .....	377
German .....	19	United States series .....	170
Greek .....	1		
Indian .....	23	Total stations reporting to June 30, 1884 .....	547
Italian .....	18	Total stations reporting to June 30, 1883 .....	506
Japanese .....	22		
Mauritius .....	1	An increase of .....	41
Mexican .....	13		
Netherlands .....	6		

The office has the co-operation of the following steamship lines:

Allan Line, A. Schumacher & Co., of Baltimore, and H. & A. Allen, of Boston, Mass., and Portland, Me., agents; American Line, Peter Wright & Sons, agents; Anchor Line, Henderson Bros., agents; Atlas Line, Pim, Forwood & Co., agents; Amsterdam Line, R. R. H. toe Laer, agent; Arrow Line, Simpson & Spence, agents; Atlantic Transportation Company of London, England; Boston and Halifax Line, F. W. Nickerson, agent; Bristol City Line, Arkell & Co., agents; Beaver Line, Seager Brothers, agents; Booth's Steamship Company, Booth & Co., agents; California and Mexican Steamship Company, J. Birmingham, agent; Castle Line, F. Skinner & Co., owners, London, England; Cromwell Line, Clark & Seaman, agents; Carr's Steamship Line; Donaldson Clyde Line, J. M. Brown & Co., agents; Edwards' Steamship Line, Geo. F. Bulley, agent; General Transatlantic Company, Louis de Bebian, agent; Gulon Line, Williams & Guion, agents; Hamburg-American Packet Company, Kuhnhardt & Co., agents; Inman Line, John G. Dale, agent; Johnston Line, Patterson, Ramsey & Co., agents; Leyland Line, Thayer & Lincoln, agents; Lampot & Holt's Line, Lampot & Holt, Liverpool, England; Liverpool, Brazil and River Plate Steamship Company, Busk & Jevons, agents; Mallory Line, C. H. Mallory & Co., agents; Mediterranean and New York Steamship Company, Phelps Bros. & Co., agents; Merchants' Express Line, Funch, Edye & Co., agents; Merchants and Miners' Transportation Company, A. L. Huggins, agent; Merchants' Steamship Company, R. B. Borland, agent; Mississippi and Dominion Steamship Line, Flinn, Main & Montgomery, managing directors, Liverpool, England; Morgan Line, Bogart & Morgan, agents; Monarch Line, Patton, Vickers & Co., agents; New York, Havana and Mexican Mail Steamship Company, F. Alexandre & Sons, agents; New York and Cuba Mail Steamship Company, James E. Ward & Co., agents; National Line, F. W. J. Hurst, manager; North German Lloyd, A. Schumacher & Co., Baltimore, and Oelrichs & Co., agents, New York; Occidental and Oriental Steamship Company, Leland Sanford, president, San Francisco; Ocean Steamship Company, George Young, agent; Oregon Railway and Navigation Company, K. von Oterendorp, agent; Oregon Improvement Company, J. L. Howard, agent; Oceanic Steamship Company, —; Pacific Coast Steamship Company, Goodall, Perkins & Co., agents; Pacific Mail Steamship Company, Williams, Dimond & Co., agents, San Francisco, and H. J. Bulley, superintendent, New York; Quebec Steamship Company, E. A. Outerbridge & Co., agents; Red D Line, Boulton, Bliss & Dallet, agents; Red Star Line, Peter Wright & Sons, agents, New York and Philadelphia; Rotterdam Line, Funch, Edye & Co., agents; Royal Mail Steam Packet Company, Sanderson & Son, agents; State Line, Austin, Baldwin & Co., agents; Thingvalla Line, Funch, Edye & Co., agents; Union Steamship Company, of Southampton, England; Warren Line, Warren & Co., agents; White Cross Line, Funch, Edye & Co., agents; White Star Line, R. J. Corrie, agent; Wilson Line, Sanderson & Son, agents; Winsor Line, R. B. Sampson, agent. Also the co-operation of the New York Herald Weather Service.

## SUMMARY.

Total steamship lines reporting to June 30, 1884.....	57
Total steamship lines reporting to June 30, 1883.....	59
Vessels reporting in the British Navy.....	77
Vessels reporting in the Portuguese Navy.....	6
Vessels reporting in the Swedish Navy.....	3
Vessels reporting in the United States Navy.....	52
Marine reports furnished through the British meteorological office, number of vessels.....	40
Marine reports furnished through the New York Herald weather service, number of vessels.....	65
Steamships, sailing vessels, &c., reporting direct to this office.....	416
Total vessels taking observations to June 30, 1884.....	659
Total vessels taking observations to June 30, 1883.....	636
An increase of .....	54
Total land stations reporting to June 30, 1884.....	547
Total vessels, &c., reporting to June 30, 1884.....	659
Total stations reporting to June 30, 1884.....	1,206
Total stations reporting to June 30, 1883.....	1,111
An increase of stations over 1883 .....	95

## RECAPITULATION.

	1883.	1884.	Increase.
Land stations .....	506	547	41
Naval reports .....	124	128	14
Steamships and miscellaneous marine.....	481	531	40
Total.....	1,111	1,206	95

## APPENDIX 13.

### REPORT FOR THE YEAR ENDING JUNE 30, 1884, ON THE CHATTANOOGA SYSTEM OF FLOOD WARNINGS.

The special observations in connection with the Chattanooga system of flood warnings were resumed December 1, 1883, and continued until March 31, 1884, which period embraces the season during which dangerous floods are most likely to occur.

This system was originally organized and operated by the Iron, Coal and Manufacturers' Association of Chattanooga, Tenn., and, by request of the association, was transferred to the Signal Service during the autumn of 1882. Final arrangements were, however, not completed in time to put the system in operation before February 1, 1883.

Chattanooga is peculiarly liable to floods of great violence. There are between three and four millions of dollars invested in manufacturing interests, principally iron and steel works. At Rockwood, Tenn., distant about 95 miles by river from Chattanooga, the Roane Iron Company have half a million dollars invested in furnaces.

A height of 38 feet in the Tennessee River causes most factories to stop; a height of 50 feet is not unusual, especially during the winter months. The importance of timely warning of dangerous rises in the Tennessee River and its tributaries, above Chattanooga, is therefore apparent.

The Signal Service having perfected arrangements to take charge of the system, the following points were selected as stations of observation and report, covering the Tennessee River and its tributaries above Chattanooga, and embracing a drainage area of over 20,000 square miles, viz: Rockwood, Roane County, Tennessee; Kingston, Roane County, Tennessee; Charleston, Bradley County, Tennessee; Loudon, Loudon County, Tennessee; Knoxville, Tennessee; Clinton, Anderson County, Tennessee; Strawberry Plains, Jefferson County, Tennessee; Leadvale, Jefferson County, Tennessee.

With the exception of Strawberry Plains, the least important point, observers were secured at all of the above stations, and the first reports were made February 1, 1883. At the beginning of the present season reports began promptly December 1, 1883, and continued until March 31, 1884.

Each observer is supplied with a river-gauge, rain-gauge, and measuring-rod, also with the necessary blanks for reporting by mail and telegraph. Observations are taken daily (Sundays included), at 2 p. m., local time, and embrace height of river, amount of rainfall, state of weather, direction of wind, and depth of snow remaining on ground. The readings are noted on a postal card prepared for this purpose, and immediately mailed to the Signal Corps observer at Chattanooga. When the rise in river exceeds a fixed limit, or the rainfall equals or exceeds two inches, the observations are enciphered and telegraphed to Chattanooga.

Special reports are also made to the observer at Chattanooga of the closing and opening of navigation by the river freezing over and the breaking up of the ice, of the formation or breaking up of ice dams or other obstructions in the river, and of the presence of large quantities of floating ice or timber. When the river is approaching the danger line, and rising rapidly, the observer at Chattanooga is authorized to call for special telegraphic reports at 8 a. m. and 8 p. m. daily until the danger is past.

Upon the receipt of all regular and special reports at Chattanooga they are immediately bulletined at prominent points in the city, and in case of floods special reports are telephoned to the principal iron works, rolling mills, &c.

Of the great benefits derived from timely warnings of approaching floods there can be no doubt. The fact that a private association organized and operated a similar system at its own expense is sufficient proof of the importance attached to these reports. It is believed that increased efficiency of service and accuracy of observations were obtained by the reorganization of the system and placing it under the control of the Signal Service.

The following extracts from Sergeant Goulding's report are submitted in this connection:

"Danger line was passed on the night of March 7, but the observers had reported by telegraph the condition of the river at their respective stations, and abundant

time was given for preparing for the inevitable high water. \* \* \* The maximum of 43 feet was not reached until 2 a. m. of March 11. This is the highest point attained since the flood of 1875, which reached 54 feet. \* \* \* It will be seen that three days' warning can be given of danger. \* \* \* It has been difficult to reduce the benefits which have accrued from the flood signal service to a valuation in dollars and cents, but a low estimate of property saved would amount to \$5,000, which is almost fifteen times what the service has cost during the past season. The service is highly appreciated in the community, and the esteem in which it is held is set forth in the extract furnished as Appendix B, from the memorial to Congress signed by the president of the Board of Trade and of the Coal, Iron and Manufacturers' Association of this city. \* \* \* In the future development of the service it will be an easy matter to furnish other communities in the Tennessee Valley below us valuable information as to floods by mail or telegraph. Such information has been repeatedly solicited."

The *Chattanooga Daily Times* of March 10, 1884, speaking of the flood on that date, concludes as follows: "The efficiency and value of the flood-signals system has been clearly demonstrated in this tide. It has given accurate information, and the predictions were verified almost to the inch. Our community will support and encourage it with the hearty good will."

F. M. M. BEALL,  
*Second Lieutenant, Signal Corps.*

SIGNAL OFFICE, WASHINGTON,  
August 27, 1884.

## APPENDIX 14.

### REPORT FOR THE YEAR ENDING JUNE 30, 1884, ON FROST WARNINGS.

The system of frost warnings for the benefit of the tobacco, sugar, and fruit growing districts, which was organized during the summer of 1882, was resumed at the beginning of the frost season in 1883. Additional points of distribution were established, and all centers notified in advance to prepare and arrange for the prompt handling and disseminating of messages. All stations selected to bulletin messages were supplied with the necessary blanks through the superintendents of the various railroads on which they are located, and arrangements were renewed with the Western Union Telegraph Company and the co-operating railroads for the prompt dispatch and publication of the warnings.

The system as now in operation consists of 26 centers to which frost warnings are sent direct from this office, and 763 stations receiving the warnings from the centers and publishing the same in the form of bulletins. Immediately upon the receipt of a frost message at a center the Signal Corps observer, or Western Union Company's manager where there is no signal station, copies the same on blanks previously prepared, and each addressed to the stations on one of the various railroads diverging from the center, and files the copies for transmission. When received at the stations the messages are at once bulletined by the operators.

Special messages are sent to a number of places for the benefit of neighboring points that cannot be reached by telegraph. These are distributed by mail or by special messengers, and in some instances by prearranged signals.

The tobacco-growing districts to which warning is sent embrace the western half of Massachusetts, the State of Connecticut, a small portion of Southern New York, the eastern half of Pennsylvania, Central Maryland and Virginia, the western halves of North Carolina and Tennessee, the State of Kentucky, Southern Ohio and Indiana, Eastern Missouri, and the southern portion of Central Wisconsin.

Cranberry interests are protected in Barnstable County, Massachusetts, and along the Camden and Atlantic Railroad in New Jersey.

Frost warnings for the benefit of sugar-growers are distributed in Southeastern Louisiana, and the fruit-growers of Northern Florida receive warnings from Jacksonville as a center. Special messages in the interest of sugar and fruit crops are sent to points in South Carolina, Tennessee, and Texas. A complete list of stations, classified according to centers of distribution and the various railroads on which they are located, was prepared by the telegraph division, and has been published as Instructions No. 83 of 1884. This list will greatly facilitate the annual arrangements for distributing frost warnings, and lessen the liability to errors and delays incidental to changes, between seasons, in observers or managers at centers.

Under the existing agreement between this office and the Western Union Telegraph Company, full rates are paid for frost messages from here to centers, and half rates from centers to the various stations.

The telegraph division, having charge of the distribution only, of frost warnings, has no data to report on the verification of or the benefits derived from the same.

Although the system of frost warnings is now complete, so far as the predictions are made and the information sent to the telegraph offices at the points named in Instructions No. 83 of 1884, yet I am not able to say whether the information, after getting to these telegraph offices, reaches that portion of the public for which it is intended. It is the promised duty of the operators to post this information at their offices. Granting that this is always done, the question then arises as to how many of these telegraph offices are visited by the farmer, the planter, or the fruit-grower.

The present condition of the appropriation for this purpose prevents this service from improving this condition of affairs, but it is hoped that the present system of State weather services will be developed to the extent that this office will only be required to furnish the information to these services and they to see to its proper dissemination.

F. M. M. BEALL,  
*Second Lieutenant, Signal Corps.*

SIGNAL OFFICE,  
Washington, August 27, 1884.

## APPENDIX 15.

### REPORT ON THE SYSTEM OF COTTON-REGION REPORTS FOR THE YEAR ENDING JUNE 30, 1884.

SIGNAL OFFICE, WAR DEPARTMENT,  
Washington City, July 1, 1884.

To the CHIEF SIGNAL OFFICER OF THE ARMY,  
Washington, D. C.:

SIR: I have the honor to submit the following report of the work done in Stations Division in connection with the system of cotton-region reports for the year ending June 30, 1884.

This system of reports is an arrangement made, with the co-operation of railroads and telegraph lines in the Southern States, by which reports of the rainfall and maximum and minimum temperatures are collected and disseminated throughout the commercial centers of the cotton region from April 1 to October 31 each year.

The stations are generally located on the railroad lines where the observations are made, and sent direct to the centers by wire.

The cotton-growing region is divided into districts.

The districts have been formed with reference to existing co-operating railroad lines to secure the best telegraphic facilities, and arranged to prevent overlapping of territory, which would produce errors in the preparation of mean temperatures and average rainfall.

Each district has a center for the concentration of reports, the name of which is used to designate the district.

The districts embrace the territory adjacent to more important cities where Signal Service stations are located.

Observations are made by agents and operators of the railroad authorities for rainfall and maximum and minimum temperatures simultaneously at 5 p. m. "central," or 6 p. m. "eastern," time, according to the location of the stations.

Similar observations are made by the Signal Service observers at all centers.

The rainfall and maximum and minimum temperatures are enciphered at the stations, and sent by telegraph to the centers of the districts to which the stations belong.

At the centers, the Signal Service observers, having collected all the reports from the stations of their districts so far as possible, make up the average rainfall and average maximum and minimum temperatures for the districts.

These are then enciphered and sent, at the 11 p. m. circuit hour, over the Washington and Lake City, the New Orleans and Augusta, and the New Orleans and Cincinnati circuits.

The reports thus received at Signal Service stations on these circuits are, after preparation of the bulletins for the information of the public, filed and preserved as office records.

The telegraphic means from cotton-region centers are made up from the reports of sub-stations received by the observer, whenever reports from one or more sub-stations are received.

The words "two," "three," "four," &c., are added to the cipher used in sending these reports over circuits to indicate the number of stations, including his own, used in making up the means.

If no reports are received from sub-stations, the central station sends its own report, and adds the word "one," to show that no reports were received.

To illustrate the method of sending reports over telegraphic circuits, take Savannah as a district center.

Savannah makes out a mean of the maximum temperatures, a mean of the minimum temperatures, and an average of the rainfall for the district, and sends this report, written on Form 203, over the Washington and Lake City circuit, as follows:

"Savannah, thirteen, firmly, vessel, radish." This translated means that in Savannah district, thirteen stations reporting, the mean of the maximum temperatures is 72 degrees, the mean of the minimum temperatures is 53 degrees, and the average rainfall is .13 of an inch.

Each of the other centers on the Washington and Lake City, the New Orleans and Augusta, and the New Orleans and Cincinnati circuits sends the report from that district over its own circuit.

The following-named stations also receive cotton-region reports with the 11 p. m. telegraphic observation: Charlotte, N. C.; Chattanooga, Tenn.; Cincinnati, Ohio; Louisville, Ky.; Nashville, Tenn.; Norfolk, Va.; Pensacola, Fla., and Washington, D. C.

Washington sends all reports to Baltimore, Philadelphia, New York City, and Boston.

Memphis sends all reports to Saint Louis.

Augusta transfers all reports received at that station over the Washington and Lake City circuit to the New Orleans and Augusta circuit, and all reports received over the New Orleans and Augusta circuit to the Washington and Lake City circuit.

New Orleans transfers all reports from the New Orleans and Augusta circuit to the New Orleans and Cincinnati circuit, and from the New Orleans and Cincinnati circuit to the New Orleans and Augusta circuit.

New Orleans sends reports from all centers to Galveston and Shreveport by special message.

Galveston sends its district report over the San Antonio and New Orleans circuit to New Orleans, where it is transferred to the New Orleans and Cincinnati and the New Orleans and Augusta circuits.

Memphis sends all reports to Saint Louis by special message.

The reports from Austin, Cuero, Dallas, Houston, Huntsville, Longview, Tyler, and Waco, Tex., are sent to New Orleans by special message from Galveston.

The Signal Service observer at each station at which cotton-region reports are received furnishes the local press copies for publication the next morning, and also bulletins them at the Cotton Exchange and other authorized places where they are of the most benefit to the public.

The following is a description of the forms used in connection with this work:

Form 138 is a manifold bulletin showing the average maximum and minimum temperatures and rainfall for the several districts for the past 24 hours, and is posted daily at each center in places most convenient to persons interested.

Form 138 A is also a manifold bulletin, and is used by the observers at the centers to show the maximum and minimum temperatures and rainfall at each station in their districts.

Form 144 A is used at each cotton-region station to record the maximum and minimum temperatures, rainfall, time of taking observation, and time of filing the report for transmission. The form is mailed to this office at the end of each month, and is used in the preparation of meteorological data.

Form 203 (card) is used by the observers at sub-stations in enciphering each observation, and is retained and filed as part of the station records.

Form "condition of instruments" (card) is used once each month by sub-stations in reporting the condition of meteorological instruments to centers.

Observations were continued during July, August, September, and October, 1883, there being 131 stations reporting—5 regular Signal Service stations and 126 special cotton-region stations—as will be seen by the following list:

District centers.	Sub-stations.
Atlanta, Ga. ....	Calhoun, Ga.; Carterville, Ga.; Dalton, Ga.; Gainesville, Ga.; Griffin, Ga.; Newnan, Ga.; Spartanburg, S. C.; Toccoa, Ga.; West Point, Ga.
Augusta, Ga. ....	Allendale, S. C.; Athens, Ga.; Chester, S. C.; Columbia, S. C.; Columbus, Ga.; Covington, Ga.; Macon, Ga.; Madison, Ga.; Union Point, Ga.
Charleston, S. C. ....	Branchville, S. C.; Hardenville, S. C.; Jacksonville, S. C.; Kingstree, S. C.; Saint George's, S. C.; Saint Matthew's, S. C.; Yemassee, S. C.
Galveston, Tex. ....	Austin, Tex.; Beaumont, Tex.; Belton, Tex.; Corsicana, Tex.; Cuero, Tex.; Dallas, Tex.; Hearne, Tex.; Hempstead, Tex.; Houston, Tex.; Huntsville, Tex.; Longview, Tex.; Luling, Tex.; Orange, Tex.; *Palestine, Tex.; San Antonio, Tex.; Sour Lake, Tex.; Tyler, Tex.; Waco, Tex.; Weatherford, Tex.; Weimar, Tex.
Little Rock, Ark. ....	Arkansas City, Ark.; Brinkley, Ark.; Devall's Bluff, Ark.; *Fort Smith, Ark.; Kennett, Ark.; Madison, Ark.; Malvern, Ark.; Monticello, Ark.; Paris, Tex.; Prescott, Ark.; Russellville, Ark.; Texarkana, Ark.; Walnut Ridge, Ark.
Memphis Tenn. ....	Batesville, Miss.; Brownsville, Tenn.; Clarksville, Tenn.; Corinth, Miss.; Decatur, Ala.; Erin, Tenn.; Grand Junction, Tenn.; Grenada, Miss.; Hernando, Miss.; Milan, Tenn.; *Nashville, Tenn.; Paris, Tenn.; Scottsborough, Ala.; Tusculumbia, Ala.; Withee, Tenn.
Mobile, Ala. ....	Aberdeen, Miss.; Columbus, Miss.; Macon, Miss.; Meridian, Miss.; Okolona, Miss.; State Line, Miss.; Wayneborough, Miss.
Montgomery, Ala. ....	Birmingham, Ala.; Calera, Ala.; Demopolis, Ala.; Greenville, Ala.; Opelika, Ala.; Pine Apple, Ala.; Selma, Ala.; Talladega, Ala.; Tuscaloosa, Ala.; Uniontown, Ala.



District centers.	Sub-stations.
New Orleans, La. ....	Alexandria, La.; Amite City, La.; Brookhaven, Miss.; Cheneyville, La.; Coushatta, La.; Franklin, La.; Morgan City, La.; New Iberia, La.; Natchitoches, La.; Pass Christian, Miss.; Scranton, Miss.; Terre Bonne, La.; Vermillionville, La.; Whiteville, La.
Savannah, Ga. ....	Albany, Ga.; Allapaha, Ga.; Bainbridge, Ga.; *Cedar Keys, Fla.; Eastman, Ga.; Fernandina, Fla.; Fort Gaines, Ga.; Jessup, Ga.; Live Oak, Fla.; Millen, Ga.; Quitman, Ga.; Smithville, Ga.; Thomasville, Ga.; Waldo, Fla.; Way Cross, Ga.
Vicksburg, Miss. ....	Edwards, Miss.; Jackson, Miss.; Lake, Miss.; Monroe, La.
Wilmington, N. C. ....	*Charlotte, N. C.; Cheraw, S. C.; Florence, S. C.; Goldsborough, N. C.; Lumberton, N. C.; Salisbury, N. C.; Wadesborough, N. C.; Weldon, N. C.

Stations marked thus \* are regular Signal Service stations.

Observations were discontinued October 31, 1883, and resumed April 1, 1884.

Prior to resumption steps were taken to increase the usefulness of this branch of the service by dropping stations thought to be of little importance and adding others of more value, and by transferring from one district to another.

Looking to this end the following changes were made in the arrangement of the cotton-region stations:

In the Atlanta district, Calhoun, Ga., was dropped, and Greenville, S. C., added. Columbus, Macon, and Madison, Ga., were transferred from the Augusta to the Atlanta district.

In the Augusta district, Columbus, Covington, Macon, and Madison, Ga., were dropped (Columbus, Macon, and Madison transferred), and Batesburg, S. C., Blackville, S. C., Camak, Ga., Greenwood, S. C., Waynesborough, Ga., and Washington, Ga., added.

In the Galveston district, Columbia, Tex., was added.

In the Little Rock district, Walnut Ridge, Ark., was dropped, and Helena, Magnolia, Newport, and Pine Bluff, Ark., were added.

In the Memphis district, Clarksville and Erin, Tenn., were dropped, and Bolivar, Tenn., Covington, Tenn., Dyersburg, Tenn., Holly Springs, Miss., and Oxford, Miss., were added.

In the Mobile district, State Line, Ala., was dropped, and Evergreen and Livingston, Ala., were added.

In the Montgomery district, Tuscaloosa, Ala., was dropped, and Eufaula, Fort Deposit, Goodwater, Marion, and Troy, Ala., were added.

In the New Orleans district, Franklin, La., Morgan City, La., New Iberia, La., Pass Christian, Miss., Scranton, Miss., and Terre Bonne, La., were dropped, and Hazlehurst, Miss., Minden, La., Natchez, Miss., Opelousas, La., and Shreveport, La., were added.

In the Vicksburg district, Greenville, Miss., was added.

In the Wilmington district, Raleigh and New Berne, N. C., were added.

Of this rearrangement the following is a

#### RECAPITULATION.

Number of new stations added .....	33
Number of old stations dropped .....	13
Number of stations transferred .....	3
Number of stations in operation during July, August, September, and October, 1883 .....	131
Number of stations it was intended to operate during remainder of season ending October 31, 1884 .....	150

Some difficulty was met with in getting the new stations in operation, owing to delays in securing passes for the Signal Service observers over railroads to points selected.

The stations at Goodwater and Troy, Ala., had to be discontinued, as the telegraph company controlling the lines from Goodwater to Opelika and from Troy to Union Springs refused to do the telegraphing free. The stations were discontinued April 29, 1884.

Madison, Ga., and Greenville, Miss., were discontinued for a like cause, April 25 and June 4, 1884, respectively.

The reports from Demopolis, Talladega, and Uniontown, Ala., had to pass over the Western Union Telegraph Company's line to reach the district center (Montgomery), and could not be sent without expense to the service. These stations were therefore discontinued May 3, 1884. This action was rendered necessary by the limited appropriations for this branch of the service.

On June 1, 1884, the name of the station at Vermillionville, La., in the New Orleans

district, was changed to La Fayette, La., to agree with the records of the Post-Office Department.

Anderson, S. C., was added to the Atlanta district April 9, 1884.

Mr. J. W. Hopkins, chairman of the Meteorological Committee of Nashville, Tenn., in a communication to the observer in that city, called attention to the absence of a cotton-region station in Southeast Tennessee, and recommended the establishment of a station at Pulaski, Tenn. Mr. Hopkins' suggestion could not be carried out, owing to insufficient funds.

Upon the recommendation of Hon. W. R. Cox, M. C., the observer at Wilmington, N. C., was instructed to telegraph daily the means of the several districts to Mr. A. A. Thompson, secretary of the Cotton Exchange, Raleigh, N. C. The reports are bulletined at the exchange rooms and post-office.

The pay of the (civilian) observers continues at 20 cents per report made, while that of the operators employed at centers, &c., collecting reports for concentration, remains at 5 cents per report.

Messengers are employed collecting reports from railroad offices at centers, &c., at the following places: Houston, Tex., \$5 per month; New Orleans, La., \$15 per month; Selma, Ala., \$5 per month.

During the year reports were, as a rule, received regularly and on time at the centers.

In some few cases the railroad agents, acting as cotton-region observers, refused to take the observations on Sundays, giving as a reason the fact that no railroad duties were performed on those days.

Much credit is due the railroads generally for their liberality in granting passes to our observers for the purpose of establishing and discontinuing stations.

The interest that has been taken in the cotton-region system of reports since its establishment not only continues but is decidedly on the increase, and the estimation in which it is held by cotton-growers, as shown by communications to this office, evidences that it is productive of the best results.

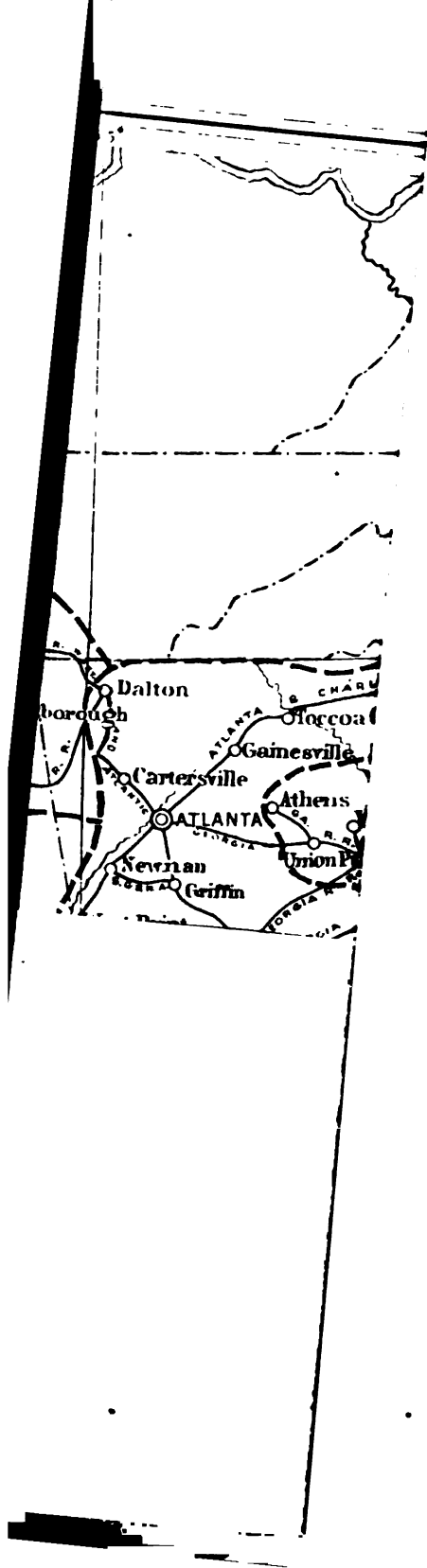
Many courtesies were extended by the several cotton exchanges during the year to the office in its efforts to extend the usefulness of the system.

The following is a list of stations now in operation, arranged alphabetically under their respective centers, showing the railroads on which they are located and the railroad time in use:

District center.	Sub-station.	Time in use.	Railroads co-operating with the Signal Service.
Atlanta.....	Anderson, S. C.....	Eastern.	Columbia and Greenville.
	Cartersville, Ga.....	Central.	Eastern and Western of Alabama; Western and Atlantic.
	Columbus, Ga.....	do	Mobile and Gulf; Columbus and Rome; Columbus and Western; Southwestern.
	Dalton, Ga.....	do	East Tennessee, Virginia and Georgia; Western and Atlantic.
	Gainesville, Ga.....	do	Richmond and Danville; Gainesville, Jefferson and Southern.
	Greenville, S. C.....	Eastern.	Carillon and Greenville; Richmond and Danville.
	Griffin, Ga.....	Central.	Central of Georgia; Savannah, Griffin and North Alabama.
	Macon, Ga.....	do	Georgia; Central of Georgia; East Tennessee, Virginia and Georgia; Southwestern.
	Newnan, Ga.....	do	Athens and West Point; Savannah, Griffin and North Alabama.
	Spartanburg, S. C.....	Eastern.	Asheville and Spartanburg; Richmond and Danville; Spartanburg, Union and Columbia.
Augusta.....	Toocosa, Ga.....	Central.	Elberton Air Line; Richmond and Danville.
	West Point, Ga.....	do	Atlanta and West Point; Western of Alabama.
	Allendale, S. C.....	do	Port Royal and Augusta.
	Athens, Ga.....	do	Georgia; Northeastern of Georgia.
	Batesburg, S. C.....	Eastern.	Charlotte, Columbia and Augusta.
	Blackville, S. C.....	do	South Carolina.
	Camak, Ga.....	Central.	Georgia.
	Chester, S. C.....	Eastern.	Charlotte, Columbia and Augusta.
	Columbia, S. C.....	do	Charlotte, Columbia and Augusta; Columbia and Greenville; South Carolina; Wilmington, Columbia and Augusta.
	Greenwood, S. C.....	Central.	Augusta and Knoxville; Columbia and Greenville.
Charleston.....	Union Point, Ga.....	do	Georgia.
	Washington, Ga.....	do	Do.
	Waynesborough, Ga.....	do	Central of Georgia.
	Branchville, S. C.....	Eastern.	South Carolina.
	Hardeeville, S. C.....	Central.	Charleston and Savannah.
	Jacksonborough, S. C.....	do	Do.
	Kingstree, S. C.....	Eastern.	Northeastern.
	Saint George's, S. C.....	do	South Carolina.
	Saint Matthew's, S. C.....	do	Do.

## REPORT OF THE CHIEF SIGNAL OFFICER.

District center.	Sub-station.	Time in use.	Railroads co-operating with the Signal Serv
Charleston .....	Yemassee, S. C. ....	Central.	Port Royal and Augusta; Charleston and Savannah.
Galveston .....	Austin, Tex. ....	do	Austin and Northwestern; Houston and Central; International and Great Northern.
	Beaumont, Tex. ....	do	Texas and New Orleans; Galveston, Harrisburg and San Antonio.
	Belton, Tex. ....	do	Gulf, Colorado and Santa Fé; Missouri Pacific.
	Columbia, Tex. ....	do	International and Great Northern.
	Corsicana, Tex. ....	do	Houston and Texas Central; Texas and Santa Fé.
	Cuero, Tex. ....	do	Gulf, Western Texas and Pacific.
	Dallas, Tex. ....	do	Houston and Texas Central; Gulf, Colorado and Santa Fé; Texas and Pacific; Missouri Pacific.
	Hearne, Tex. ....	do	Houston and Texas Central; International and Great Northern.
	Hempstead, Tex. ....	do	Houston and Texas Central.
	Houston, Tex. ....	do	Galveston, Harrisburg and San Antonio; Houston, Houston and Henderson; Gulf, Colorado and Santa Fé; Houston and Texas Central; Houston and West Texas; International and Northern; Texas and New Orleans; Texas Central.
	Huntsville, Tex. ....	do	International and Great Northern.
	Longview, Tex. ....	do	Texas and Pacific; Galveston, Sabine and Louisiana; International and Great Northern.
	Luling, Tex. ....	do	Galveston, Harrisburg and San Antonio.
	Orange, Tex. ....	do	Texas and New Orleans.
	Palestine, Tex. ....	do	International and Great Northern.
	San Antonio, Tex. ....	do	Galveston, Harrisburg and San Antonio; International and Great Northern.
	Sour Lake, Tex. ....	do	Texas and New Orleans.
	Tyler, Tex. ....	do	International and Great Northern; Texas and Louisiana.
	Waco, Tex. ....	do	Houston and Texas Central; Missouri Pacific.
Little Rock .....	Weatherford, Tex. ....	do	Texas and Pacific.
	Weimar, Tex. ....	do	Galveston, Harrisburg and San Antonio.
	Arkansas City, Ark. ....	do	Little Rock, Mississippi River and Texas.
	Brinkley, Ark. ....	do	Memphis and Little Rock; Arkansas Midland.
	Devall's Bluff, Ark. ....	do	Batesville and Brinkley; Texas and Saint Louis.
	Fort Smith, Ark. ....	do	Little Rock and Fort Smith; Saint Louis and Chicago.
	Helena, Ark. ....	do	Arkansas Midland; Saint Louis, Iron Mountain and Southern.
	Kensett, Ark. ....	do	Saint Louis, Iron Mountain and Southern.
	Madison, Ark. ....	do	Memphis and Little Rock.
	Magnolia, Ark. ....	do	Texas and Saint Louis (branch).
	Malvern, Ark. ....	do	Hot Springs; Saint Louis, Iron Mountain and Southern.
	Monticello, Ark. ....	do	Little Rock, Mississippi River and Texas.
	Newport, Ark. ....	do	Saint Louis, Iron Mountain and Southern.
	Paris, Tex. ....	do	Texas and Pacific.
	Pine Bluff, Ark. ....	do	Little Rock, Mississippi River and Texas; Saint Louis.
	Prescott, Ark. ....	do	Saint Louis, Iron Mountain and Southern.
	Russellville, Ark. ....	do	Little Rock and Fort Smith.
	Texarkana, Ark. ....	do	Texas and Pacific; Saint Louis, Iron Mountain and Southern; Texas and Saint Louis.
Memphis .....	Batesville, Miss. ....	do	Mississippi and Tennessee.
	Bolivar, Tenn. ....	do	Illinois Central.
	Brownsville, Tenn. ....	do	Louisville and Nashville.
	Corinth, Miss. ....	do	Memphis and Charleston; Mobile and Ohio.
	Covington, Tenn. ....	do	Chesapeake, Ohio and Southwestern.
	Decatur, Ala. ....	do	Louisville and Nashville; Memphis and Charleston.
	Dyersburg, Tenn. ....	do	Chesapeake, Ohio and Southwestern.
	Grand Junction, Tenn. ....	do	Illinois Central; Memphis and Charleston.
	Grenada, Miss. ....	do	Mississippi and Tennessee; Illinois Central.
	Hernando, Miss. ....	do	Mississippi and Tennessee.
	Holly Springs, Miss. ....	do	Illinois Central.
	Milan, Tenn. ....	do	Louisville and Nashville; Illinois Central.
	Nashville, Tenn. ....	do	Louisville and Nashville; Nashville, Chattanooga and Saint Louis.
	Oxford, Miss. ....	do	Illinois Central.
	Paris, Tenn. ....	do	Louisville and Nashville.
	Scottsborough, Ala. ....	do	Memphis and Charleston.
	Tusculum, Ala. ....	do	Do.
	Withee, Tenn. ....	do	Louisville and Nashville.
Mobile .....	Aberdeen, Miss. ....	do	Mobile and Ohio.
	Columbus, Miss. ....	do	Georgia Pacific; Mobile and Ohio.
	Evergreen, Ala. ....	do	Louisville and Nashville.
	Livingston, Ala. ....	do	Alabama Great Southern.
	Macon, Miss. ....	do	Mobile and Ohio.





District center.	Sub-station.	Time in use.	Railroads co-operating with the Signal service.
Mobile .....	Meridian, Miss .....	Central	Alabama Great Southern; East Tennessee, Virginia and Georgia; Mobile and Ohio; New Orleans and Northeastern; Vicksburg and Meridian.
	Okolona, Miss .....	do	Mobile and Ohio.
	Waynesborough, Miss .....	do	Do.
Montgomery .....	Birmingham, Ala. ....	do	Alabama Great Southern; Louisville and Nashville.
	Calera, Ala. ....	do	Louisville and Nashville; East Tennessee, Virginia and Georgia.
	Enfauia, Ala. ....	do	Southwestern; Montgomery and Enfauia; Enfauia and Clayton.
	Fort Deposit, Ala. ....	do	Louisville and Nashville.
	Greenville, Ala. ....	do	Do.
	Marion, Ala. ....	do	Cincinnati, Selma and Mobile.
	Opelika, Ala. ....	do	East Alabama; Columbus and Western; Western of Alabama.
	Pine Apple, Ala. ....	do	Louisville and Nashville.
	Selma, Ala. ....	do	East Tennessee, Virginia and Georgia; Cincinnati, Selma and Mobile; Louisville and Nashville; New Orleans and Selma; Pensacola and Selma.
New Orleans .....	Alexandria, La. ....	do	Morgan's Louisiana and Texas; Texas and Pacific.
	Amite City, La. ....	do	(Merchants' Union Telegraph Line, connecting with Western Union lines at Minden.)
	Brookhaven, Miss .....	do	Do.
	Cheneyville, La. ....	do	Morgan's Louisiana and Texas; Texas and Pacific.
	Coushatta Chute, La. ....	do	(Merchants' Union Telegraph Line, connecting with Western Union lines at Minden.)
	Haskellhurst, Miss .....	do	Illinois Central.
	La Fayette, La. ....	do	Morgan's Louisiana and Texas; Texas and New Orleans.
	Minden, La. ....	do	(Merchants' Union Telegraph Line, connecting with Western Union lines at Minden.)
	Natchez, Miss .....	do	Natchez, Jackson and Columbus.
	Natchitoches, La. ....	do	(Merchants' Union Telegraph Line, connecting with Western Union lines at Minden.)
Savannah .....	Opelousas, La. ....	do	Morgan's, Louisiana and Texas.
	Shreveport, La. ....	do	Texas and Pacific.
	Whiteville, La. ....	do	Morgan's Louisiana and Texas.
	Albany, Ga. ....	do	Brunswick and Western; Savannah, Florida and Western; Southwestern.
	Allapaha, Ga. ....	do	Brunswick and Western.
	Bainbridge, Ga. ....	do	Savannah, Florida and Western.
	Cedar Keys, Fla. ....	do	Florida Transit and Peninsular.
	Eastman, Ga. ....	do	Macon and Brunswick.
	Fernandina, Fla. ....	do	Florida Transit and Peninsular.
	Fort Gaines, Ga. ....	do	Southwestern.
	Jessup, Ga. ....	do	Savannah, Florida and Western; Macon and Brunswick.
	Live Oak, Fla. ....	do	Savannah, Florida and Western; Florida Central and Western.
	Millen, Ga. ....	do	Central of Georgia.
	Quitman, Ga. ....	do	Savannah, Florida and Western.
	Smithville, Ga. ....	do	Southwestern.
	Thomasville, Ga. ....	do	Savannah, Florida and Western.
	Waldo, Fla. ....	do	Florida Transit and Peninsular; Peninsular.
	Way Cross, Ga. ....	do	Brunswick and Western; Savannah, Florida and Western.
Vicksburg .....	Edwards, Miss .....	do	Vicksburg and Meridian.
	Jackson, Miss .....	do	Illinois Central; Natchez, Jackson and Columbus; Vicksburg and Meridian.
	Lake, Miss .....	do	Vicksburg and Meridian.
Wilmington .....	Monroe, La. ....	do	Vicksburg, Shreveport and Pacific.
	Charlotte, N. C. ....	Eastern	Richmond and Danville; Carolina Central; Charlotte, Columbia and Augusta.
	Cheraw, S. C. ....	do	Cheraw and Darlington; Cheraw and Salisbury.
	Florence, S. C. ....	do	Cheraw and Darlington; Northeastern; Wilmington, Columbia and Augusta.
	Goldesborough, N. C. ....	do	Wilmington and Weldon; Atlantic and North Carolina; Richmond and Danville.
	Lumberton, N. C. ....	do	Carolina Central.
	New Bern, N. C. ....	do	Atlantic and North Carolina.
	Raleigh, N. C. ....	do	Raleigh and Gaston; Raleigh and Augusta Air Line; Richmond and Danville.
	Salisbury, N. C. ....	do	Richmond and Danville; Western of North Carolina.
	Wadesborough, N. C. ....	do	Carolina Central; Cheraw and Salisbury.
	Weldon, N. C. ....	do	Petersburg; Raleigh and Gaston; Seaboard and Roanoke; Wilmington and Weldon.

I am, very respectfully, your obedient servant,

F. M. M. BEALL,  
Second Lieutenant, Signal Corps.

## APPENDIX 16.

*List of boards of trade, chambers of commerce, and other organisations which had on June 30, 1884, meteorological committees to confer with the Chief Signal Officer of the Army.*

Place.	Organisation.	Committee.
Albany, N. Y. ....	Board of Trade .....	Charles B. Tillinghast, J. Townsend Lansing, Walter McEwan.
Alpena, Mich. ....	Board of Underwriters .....	Henry S. Seage, John N. Kelley, J. D. Holmes, B. F. Luce, Charles H. Luce.
Astoria, Oreg. ....	Chamber of Commerce .....	Dr. A. C. Kinney, M. C. Crosby.
Athens, Ga. ....	Board of Trade and Academy of Science.	B. W. Frobel, J. T. Henderson, R. J. Redding.
Augusta, Ga. ....	Cotton Exchange .....	J. M. Anderson, W. J. Pollard, G. K. Moore.
Baltimore, Md. ....	Board of Trade .....	R. W. Cator, D. L. Bartlett, Gorman H. Hunt, Frank H. Jenkins, D. T. Busby.
Bismarck, Dak. ....	Board of Trade .....	Dr. William A. Bently, F. W. McKinney, F. A. Leavenworth.
Block Island, R. I. ....		B. B. Mitchell, Ray D. Littlefield, Charles E. Perry.
Boston, Mass. ....	Society of Arts. ....	Prof. William H. Niles, Jacob A. Dresser, George L. Roberts.
Buffalo, N. Y. ....	Merchants' Exchange .....	George B. Mathews, Charles A. Sweet, John N. Scatterd, Jewett M. Richmond, Edward W. Eames.
Charleston, S. C. ....	Chamber of Commerce .....	C. Gravely, F. W. Dawson, A. D. Cohen.
Chattanooga, Tenn. ....	Iron and Coal Manufacturers' Association.	Rev. J. W. Bachman, F. J. Bennett, D. W. Chase, S. B. Lowe, John A. Hart, S. E. Read, C. D. McGuffey.
Chicago, Ill. ....	Board of Trade .....	W. H. Crocker, S. D. Foss, L. G. Holley.
Cincinnati, Ohio. ....	Board of Trade and Transportation Committee.	T. E. Livezey, George O. Clements, Charles H. Law, Alexander Hill, A. M. Dolph.
Cleveland, Ohio. ....	Board of Trade .....	R. K. Winalow, R. T. Lyon, Capt. W. B. Guyles.
Columbus, Ohio. ....	Board of Trade .....	George W. Twiss, George Cole, J. B. K. Connelly.
Denver, Colorado. ....	Chamber of Commerce and Board of Trade.	Charles F. Wilson, F. J. V. Skiff, John Brisbane Walker, Joseph T. Cornforth, B. H. Bayles.
Des Moines, Iowa. ....	Board of Trade .....	J. P. Bushnell, S. A. Robertson, W. A. Warfield.
Detroit, Mich. ....	Board of Trade .....	T. P. Kall, J. W. Flynn.
Dubuque, Iowa. ....	Board of Trade .....	Dr. A. Horr, T. W. Ruets, S. M. Langworthy.
Duluth, Minn. ....	Chamber of Commerce .....	Capt. B. G. Yocum, C. D. Wright, A. J. Miller.
Erie, Pa. ....	Board of Trade .....	John Oliver, W. B. Traak, C. H. Walbridge.
Grand Haven, Mich. ....		Hon. Dwight Cutler, T. W. Kirby, William Wallace.
Huron, Dak. ....	Board of Trade .....	John Cain, Augustine Davis, Hon. George W. Sterling.
Indianapolis, Ind. ....	Board of Trade .....	John H. Holliday, Fred. Baggs, John W. Ray.
Indianola, Tex. ....		H. J. Huck, Emile Reiffert.
Jacksonville, Fla. ....	Board of Trade .....	Dr. A. S. Baldwin, M. W. Drew, G. W. Garrett, A. W. Barra.
La Crosse, Wis. ....	Board of Trade .....	D. A. McDonald, W. W. Jones, John Raa.
Leavenworth, Kans. ....	Board of Trade .....	Dr. R. J. Brown, Judge L. Hawn, L. Mayo.
Los Angeles, Cal. ....	Board of Trade .....	Eugene Germain, John R. Mathews, John R. Niles.
Louisville, Ky. ....	Board of Trade .....	William Cornwall, Jr., J. B. Speed, Graham Wilder, J. A. Tanner, E. H. Bowen, Nick Finzer, B. M. Kelly.
Do. ....	Polytechnic Society .....	E. A. Grant, M. D., L. L. D.; Prof. J. A. Tanner, M. D.; Prof. H. W. Eaton, Ph. D.
Memphis, Tenn. ....	Cotton Exchange .....	Gen. R. F. Patterson, C. E. F. Hall, C. E. Tucker, D. P. Hadden, F. Frisch, M. Gavin, E. F. Galson, J. E. Godwin.

*List of boards of trade, chambers of commerce, &c.—Continued.*

Place.	Name of organization.	Committee.
Memphis, Tenn.....	Merchants' Exchange.....	L. N. Estee, W. T. Stone, A. Vacarro.
Milwaukee, Wis.....	Chamber of Commerce.....	John L. Hathaway, John B. Merrill, David Vance.
Mobile, Ala.....	Cotton Exchange.....	W. H. Gardner, Adolph Proskauer, D. E. Hunger.
Do.....	Chamber of Commerce.....	Hon. Peter Hamilton, W. H. Gardner, E. O. Zadek.
Nashville, Tenn.....	Merchants' Exchange.....	J. W. Hopkins, E. D. Hicks, H. W. Grantland.
New Haven, Conn.....	Chamber of Commerce.....	Henry G. Lewis, Johnson T. Platt.
New London, Conn.....	Chamber of Commerce.....	James Fitch, George T. Marshall, H. S. Bartlett, E. A. Delaney, R. M. Waterman, Leonard Smith.
New Orleans, La.....	Cotton Exchange.....	J. L. McLean, R. S. Day, J. P. Dobbins.
Do.....	Produce Exchange.....	J. T. Brodnax, H. J. Roman, C. H. Allen.
Do.....	Sugar Exchange.....	J. Barkley, B. M. King, W. B. Bloomfield, P. Lanaux, W. Henderson.
New York City.....	Cotton Exchange.....	Walter T. Miller, James F. Maury, William P. Campbell.
Norfolk, Va.....	Norfolk and Portsmouth Cotton Exchange.	John N. Vaughan, Adam Tredwell.
Omaha, Nebr.....	Board of Trade.....	Thomas Gibson, C. T. Goodman, G. V. Ames.
Oswego, N. Y.....	Board of Trade.....	J. L. McWhorter, A. S. Failing, W. R. Hosmer.
Panama, Fla.....	Board of Trade and Exchange.	Hon. S. C. Cobb, Hon. I. M. Tarble, H. Sears.
Philadelphia, Pa.....	Maritime Exchange.....	Charles Gibbons, jr., E. K. Stevenson, E. F. Parker.
Pittsburgh, Pa.....	Coal Exchange.....	Richard Barrows, M. E. Lynn, John W. Risher.
Portland, Me.....	Board of Trade.....	C. K. Farley, M. N. Rich, William Senter.
Portland, Oreg.....	Chamber of Commerce and Board of Trade.	A. F. Sears, George H. Himes, Frank Dekum.
Rochester, N. Y.....	Board of Trade.....	John Siddons, H. S. Hebard, George Schofield.
San Diego, Cal.....	Society of Natural History.	Dr. G. W. Barnes, E. J. Buell, C. J. Fox.
Sandusky, Ohio.....	Board of Trade and City Council.	J. O. Moss, C. N. Ryan, R. B. Hubbard.
San Francisco, Cal.....	Chamber of Commerce.....	William L. Merry, Jacob S. Taber, W. W. Dodge.
Savannah, Ga.....	Cotton Exchange.....	C. M. Holst, A. L. Hartridge, J. J. Wilder.
Shreveport, La.....	Cotton Exchange.....	C. H. Minge, J. S. Zeigler, J. C. Soapa.
Saint Louis, Mo.....	Cotton Exchange.....	C. M. Donaldson, C. W. Simmons, E. D. Meier, C. G. Peper, J. A. Woolridge, C. L. Dean, J. H. Cogswell.
Do.....	Merchants' Exchange.....	R. S. McCormick, Hanson Rasin, John Bird, J. L. Huse, R. M. Hubbard, Jacob Schaeffer, R. F. Sasa.
Saint Paul, Minn.....	Chamber of Commerce.....	R. O. Sweeney, Rev. David Breed, M. N. Kellogg.
Toledo, Ohio.....	Toledo Produce Exchange.	W. T. Walker, W. H. Bellman, John Cummings.
Vicksburg, Miss.....	Chamber of Commerce.....	Thomas Mount, Dr. G. W. Howard, Capt. E. C. Carroll, J. D. Tinney.
Wilmington, N. C.....	Chamber of Commerce.....	A. H. Van Bokkelen, George Harries, William L. De Rosset.
Yankton, Dak.....	Board of Trade.....	J. C. McVay, A. W. Barber, J. V. Bunker.



# APPENDIX 17.

*Stations inspected, by whom, and when, during fiscal year ending June 30, 1884.*

Station.	By whom inspected.	When inspected.
Albany, N. Y.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	March 2, 3, 1884.
Assinaboine, Fort, Mont.	Lieut. J. P. Story, acting signal officer	September 6, 7, 8, 1883.
Astoria, Oreg.	Lieut. Frank Greene, Signal Corps, U. S. A.	September 9, 1883.
Atlanta, Ga.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	April 5-7, 1884.
Baltimore, Md.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	April 2, 1884.
Bennett, Fort, Mont.	Lieut. J. P. Story, acting signal officer	July 20-23, 1883.
Benton, Fort, Mont.	do	September 4-12, 1883.
Bismarck, Dak.	do	July 31, August 1, 2, 3, 1883.
Boston, Mass.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	March 5, 6, 7, 8, 1884.
Buffalo, N. Y.	do	February 24, 25, 26, 1884.
Buford, Fort, Dak.	Lieut. J. P. Story, acting signal officer	September 7, 8, 9, 1883.
Camp Poplar River, Mont.	do	August 9-12, 1883.
Cape Henry, Va.	Lieut. Robert Craig, acting signal officer	July 3, 9, 1883.
Canby, Fort, Wash. T.	Lieut. Frank Greene, Signal Corps, U. S. A.	September 11, 12, 13, 1883.
Cairo, Ill.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	May 12, 13, 1884.
Cheyenne, Wyo.	Lieut. J. P. Story, acting signal officer	November 5-8, 1883.
Chickasaw, Tenn.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	March 26, 27, 28, 1884.
Chicago, Ill.	Lieut. P. H. Ray, acting signal officer	January 26, 1884.
Cincinnati, Ohio.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	May 17, 18, 19, 1884.
Cleveland, Ohio.	Lieut. P. H. Ray, acting signal officer	March 11, 12, 1884.
Cour d'Alene, Fort, Idaho.	Lieut. Frank Greene, Signal Corps, U. S. A.	October 30, 1883.
Columbus, Ohio.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	May 21, 22, 1884.
Crescent Bay, Wash. T.	Lieut. Frank Greene, Signal Corps, U. S. A.	October 30, 1883.
Custer, Fort, Mont.	Lieut. J. P. Story, acting signal officer	September 23-26, 1883.
Davis, Fort, Tex.	Lieut. L. E. Seabee, Signal Corps, U. S. A.	October 12, 13, 1883.
Davenport, Iowa.	Lieut. P. H. Ray, acting signal officer	February 23, 1884.
Dayton, Wash. T.	Lieut. Frank Greene, Signal Corps, U. S. A.	December 5-10, 1883.
Deadwood, Dak.	Lieut. J. P. Story, acting signal officer	September 28, 29, 1883.
Des Moines, Iowa.	Lieut. P. H. Ray, acting signal officer	February 25, 1884.
Dubuque, Iowa.	do	February 21, 22, 1884.
Eastport, Me.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	March 8-10, 1884.
El Paso, Tex.	Lieut. L. E. Seabee, Signal Corps, U. S. A.	October 10-15, 1883.
Erie, Pa.	Lieut. P. H. Ray, acting signal officer	March 14, 1884.
Fort Smith, Ark.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	May 8, 9, 1884.
Hastings, N. C.	Lieut. Robert Craig, acting signal officer	June 28-30, 1883.
Helena, Mont.	Lieut. J. P. Story, acting signal officer	September 17, 18, 1883.
Hoko, Wash. T.	Lieut. Frank Greene, Signal Corps, U. S. A.	September 23, 1883.
Indianapolis, Ind.	Lieut. P. H. Ray, acting signal officer	March 8-10, 1884.
Keokuk, Iowa.	do	February 23, 1884.
Kitty Hawk, N. C.	Lieut. Robert Craig, acting signal officer	July 8, 4, 1883.
Knoxville, Tenn.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	March 26-28, 1884.
Lapwai, Fort, Idaho.	Lieut. Frank Greene, Signal Corps, U. S. A.	August 25, 1883.
Lewiston, Idaho.	do	August 24, 1883.
Little Rock, Ark.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	April 25, 26, 1884.
Louisville, Ky.	Lieut. P. H. Ray, acting signal officer	March 6, 7, 1884.
Do.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	May 15, 16, 1884.
Los Angeles, Cal.	Lieut. R. H. Fletcher, U. S. A.	February 29, 1884.
Lynchburg, Va.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	March 24, 1884.
Maginnis, Fort, Mont.	Lieut. J. P. Story, acting signal officer	August 23, 29, 1883.
Marfa, Tex.	Lieut. L. E. Seabee, Signal Corps, U. S. A.	October 14, 1883.
Meade, Fort, Dak.	Lieut. J. P. Story, acting signal officer	September 30, 1883.
Memphis, Tenn.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	April 21-23, 1884.
Milwaukee, Wis.	Lieut. P. H. Ray, acting signal officer	February 11, 14, 1884.
Montgomery, Ala.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	April 14, 15, 1884.
Nashville, Tenn.	do	April 1-3, 1884.
Neah Bay, Wash.	Lieut. Frank Greene, Signal Corps, U. S. A.	September 27, 1883.
New Haven, Conn.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	March 22, 23, 1884.
New London, Conn.	do	March 18, 19, 1884.
New Shoreham, R. I.	do	March 20, 21, 1884.
New York, N. Y.	do	March 24-26, 1884.
North Platte, Nebr.	Lieut. J. P. Story, acting signal officer	October 9, 10, 1883.
Olympia, Wash. T.	Lieut. Frank Greene, Signal Corps, U. S. A.	September 16-18, 1883.
Omaha, Nebr.	Lieut. J. P. Story, acting signal officer	June 10, 1883.
Oswego, N. Y.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	Feb. 29, and Mar. 1, 1884.
Palestine, Tex.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	May 1, 2, 1884.
Philadelphia, Pa.	Lieut. Joseph S. Powell, Signal Corps, U. S. A.	March 27-29, 1884.
Pittsburg, Pa.	Lieut. P. H. Ray, acting signal officer	January 22, 24, 1884.
Port Angeles, Wash. T.	Lieut. Frank Greene, Signal Corps, U. S. A.	October 1-3, 1883.

*Stations inspected, by whom, and when, during fiscal year ending June 30, 1884.*

Station.	By whom inspected.	When inspected.
Portland, Oreg.....	Lieut. Frank Greene, Signal Corps, U. S. A. .	October 5-8, 1883.
Portland, Me.....	Lieut. Joseph S. Powell, Signal Corps, U. S. A. .	March 8-10, 1884.
Portsmouth, N. C.....	Lieut. Robert Craig, acting signal officer.....	June 27, 28, 1883.
Provincetown, Mass.....	Lieut. Joseph S. Powell, Signal Corps, U. S. A. .	March 15, 16, 1884.
Pyah, Wash. T.....	Lieut. Frank Greene, Signal Corps, U. S. A. .	September 30, 1883.
Rochester, N. Y.....	Lieut. Joseph S. Powell, Signal Corps, U. S. A. .	February 26, 1884.
Roseburg, Oreg.....	Lieut. Frank Greene, Signal Corps, U. S. A. .	October 19-21, 1883.
San Diego, Cal.....	Lieut. R. H. Fletcher, U. S. A. .	February 29, 1884.
Sandusky, Ohio.....	Lieut. P. H. Ray, acting signal officer.....	March 12, 13, 1884.
Saint Louis, Mo.....	do.....	February 27-29, 1884.
Shaw, Fort, Mont.....	Lieut. J. P. Story, acting signal officer.....	September 14, 15, 1883.
Shreveport, La.....	Lieut. R. B. Watkins, Signal Corps, U. S. A. .	April 28, 29, 1884.
Spokane Falls, Wash. T.....	Lieut. Frank Greene, Signal Corps, U. S. A. .	August 28-30, 1883.
Spokane, Fort, Wash. T.....	do.....	September 3, 4, 1883.
Springfield, Ill.....	Lieut. P. H. Ray, acting signal officer.....	March 1-4, 1884.
Stevens, Fort, Oreg.....	Lieut. Frank Greene, Signal Corps, U. S. A. .	September 10, 1883.
Stockton, Fort, Tex.....	Lieut. L. E. Sebree, Signal Corps U. S. A. .	October 9, 10, 1883.
Sully, Fort, Dak.....	Lieut. J. P. Story, acting signal officer.....	July 23, 1883.
Tatoosh Island, Wash. T.....	Lieut. Frank Greene, Signal Corps, U. S. A. .	September 25-27, 1883.
Vicksburg, Miss.....	Lieut. R. B. Watkins, Signal Corps, U. S. A. .	April 17, 18, 1884.
Yankton, Dak.....	Lieut. J. P. Story, acting signal officer.....	June 14, 1883.
Yates, Fort, Dak.....	do.....	July 23, 29, 1883.

# APPENDIX 18.

*List of places for which stations have been requested but not established, to June 30, 1884*

Place.	Date.	Place.	Date.
<b>Alabama:</b>		<b>Georgia—Continued.</b>	
Anburn (Agricultural and Mechanical College).	May 14, 1873	Rome .....	Apr. 24, 1874
Coffeeville .....	Dec. 23, 1880		Jan. 21, 1875
Eutaw .....	Jan. 4, 1881		Dec. 4, 1875
Florence .....	Dec. 20, 1882		Mar. 31, 1876
Friendville .....	July 20, 1873		Mar. 14, 1877
Marion .....	Apr. 20, 1880		July 13, 1878
Trinity .....	Nov. 6, 1875		
<b>Arkansas:</b>	Oct. 18, 1881	<b>Idaho:</b>	
Fayetteville (Arkansas Industrial University).	Mar. 4, 1882	Franklin .....	July 23, 1875
Fulton .....		Silver City .....	Feb. 9, 1876
Hot Springs .....	Feb. 17, 1874		
Judson University .....	Sept. 23, 1881	<b>Illinois:</b>	
	Dec. 23, 1875	Abingdon (Abingdon College) ..	Apr. 1, 1874
	Dec. 21, 1879	Bloomington .....	Aug. 30, 1874
	Aug. 2, 1871	Carbondale (Southern Illinois Normal University) ..	Oct. 1, 1873
	Dec. 10, 1877	Carthage .....	Oct. 2, 1878
	Aug. 13, 1877	Decatur .....	Sept. 2, 1872
	July 6, 1878	Galena .....	Aug. 30, 1874
<b>California:</b>		Grand Town .....	Sept. 14, 1871
Bakersfield .....	May 14, 1874	Grayville .....	Mar. 21, 1872
Cheyenne Wells .....	July 27, 1877	Jacksonville .....	June 7, 1876
Oakland (University of California).	Feb. 12, 1874	Metamora .....	Mar. 15, 1875
	Mar. 12, 1881		Aug. 8, 1871
Table Mountain .....	Apr. 15, 1884	Pana .....	Jan. 17, 1875
Tulare .....	Oct. 4, 1883	Princeton .....	Aug. 11, 1871
Wilmington .....	June 29, 1884	Quincy .....	Jan. 4, 1872
	Jan. 4, 1881		July 25, 1879
<b>Colorado:</b>			Dec. 3, 1879
Fountain .....	Dec. 4, 1871	Sandwich .....	Jan. 22, 1873
Leadville .....	Jan. 17, 1880		
Mount Massive .....	Feb. 9, 1881	<b>Indiana:</b>	
Summit .....	Feb. 23, 1882	Crawfordsville (Wabash College).	June 6, 1874
The Parks of Colorado .....	Jan. 7, 1880		
	May 24, 1871	Fort Wayne .....	Apr. 12, 1872
<b>Connecticut:</b>		Lafayette (Purdue University) ..	Apr. 14, 1879
Hartford .....	Jan. 21, 1875	Leavenworth .....	Oct. 12, 1882
Mohawk Mountains .....	Oct. 14, 1882	New Albany .....	Apr. 12, 1872
Race Rock Light-house .....	Nov. 20, 1880	Noblesville .....	July 27, 1868
The National Park .....	Nov. 7, 1880	Rockville .....	Dec. 8, 1863
		Vincennes .....	June 15, 1873
<b>Dakota:</b>		<b>Iowa:</b>	
Aberdeen .....	Feb. 18, 1882	Afton .....	Feb. 17, 1875
Chamberlain .....	June 22, 1882	Algona .....	Feb. 14, 1878
	July 17, 1882	Ames (State Agricultural College) ..	Jan. 23, 1875
	Nov. 15, 1882		
	Nov. 16, 1882	Cedar Rapids .....	Feb. 11, 1881
	Jan. 5, 1883	Fort Dodge .....	Nov. 4, 1875
	Nov. 9, 1871	Iowa City (State University) ..	Dec. 14, 1871
	Dec. 6, 1883		Jan. 2, 1875
	June 18, 1874		Jan. 2, 1875
	Dec. 6, 1883		Oct. 6, 1871
<b>Delaware:</b>		Mason City .....	Dec. 11, 1863
Cape Henlopen .....	Dec. 22, 1875	Monticello .....	Apr. 15, 1877
Newark (Delaware College) ..	Jan. 11, 1872	Sheldon .....	July 18, 1881
Ocean View .....	Apr. 18, 1884	Sioux City .....	July 18, 1881
Wilmington .....	Jan. 24, 1872		
<b>Florida:</b>		<b>Kansas:</b>	
Apalachicola .....	Sept. 10, 1883	Ellsworth .....	July 14, 1874
Fort Jupiter Light .....	Dec. 27, 1881		July 21, 1874
	Dec. 31, 1881	Emporia (State Normal School) ..	Mar. 6, 1873
	Feb. 4, 1882		Feb. 2, 1881
	Feb. 4, 1882	Gaylord .....	Dec. 27, 1879
	Oct. 27, 1882	Grainfield .....	Mar. 8, 1883
	Feb. 17, 1873	Lawrence (University of Kansas).	Jan. 16, 1873
	June 12, 1875		May 6, 1883
Three or four additional stations in the interior of the State.	May 6, 1875		Jan. 7, 1881
Titusville .....	No date.	On plains of Western Kansas and regions to southward and westward.	Dec. 21, 1873
<b>Georgia:</b>		Salina .....	July 17, 1873
Doboy Island .....	Jan. 25, 1879	Towanda .....	Apr. 2, 1877
New Switzerland .....	Feb. 3, 1882	Wichita .....	Feb. 12, 1872
			July 12, 1883
		<b>Kentucky:</b>	
		Anchorage .....	Mar. 31, 1877

*List of places for which stations have been requested, &c.—Continued.*

Place.	Date.	Place.	Date.
<b>Kentucky—Continued.</b>		<b>Missouri—Continued.</b>	
Carrollton .....	Mar. 6, 1881	Louisiana .....	Aug. 31, 1871
Lexington .....	Apr. 23, 1883	.....	Jan. 4, 1883
Richmond .....	Apr. 23, 1884	Mason City .....	Mar. 30, 1884
<b>Louisiana:</b>		Pierce City .....	Apr. 9, 1874
Balise .....	Oct. 31, 1871	.....	Nov. 10, 1880
Baton Rouge (State University and Agricultural and Me- chanical College).	Feb. 25, 1881	Rolla (Missouri School of Mines).	May 5, 1880
Lake Charles .....	June 12, 1875	Saint Joseph (University of Missouri).	July 17, 1876
.....	Oct. 15, 1877	.....	Jan. 22, 1882
Southwest Pass (Pass à l'Outre).	Mar. 20, 1871	Saint Louis (College of the Christian Brothers).	Mar. 15, 1883
<b>Maine:</b>		Springfield .....	Mar. 12, 1884
Angusta (United States Ar- senal).	Feb. 16, 1883	.....	Feb. 9, 1884
Belfast .....	Aug. 6, 1872	<b>Montana:</b>	
Calais .....	June 16, 1874	Bedford .....	Apr. 10, 1881
Crumple Island .....	Dec. 4, 1881	Butte .....	Oct. 11, 1879
.....	Dec. 10, 1881	Etcheta .....	Oct. 21, 1881
.....	Feb. 8, 1884	Livingston .....	Mar. 15, 1883
Cutler .....	Apr. 3, 1883	Missoula .....	June 23, 1882
Green Mountain .....	Sept. 21, 1882	Wolf Point .....	June 16, 1882
Oreón (State Agricultural Col- lege).	Oct. 18, 1871	<b>Nebraska:</b>	
Pemoboot Bay (entrance) .....	Feb. 17, 1873	Beatrice .....	Mar. 3, 1874
White Head .....	Jan. 19, 1883	Columbus .....	Sept. 5, 1871
<b>Maryland:</b>	Feb. 23, 1881	Fairbury .....	May 12, 1876
State Agricultural College .....	Apr. 18, 1872	Lincoln .....	Mar. 4, 1884
.....	June 21, 1873	Nebraska City .....	Aug. 14, 1874
<b>Massachusetts:</b>		<b>Nevada:</b>	
Amherst (State Agricultural College).	Mar. 30, 1878	Carson City .....	Mar. 6, 1876
Nantucket .....	Mar. 8, 1881	<b>New Jersey:</b>	
Pittsfield .....	Dec. 25, 1879	Camden (The River Iron Works)	July 29, 1874
South Framingham (State Ar- senal).	Apr. 18, 1881	Neshanic Mountains (Somer- set County).	Apr. 12, 1873
.....	July 28, 1881	Somerset County (latitude, 40° 30'; longitude, 74° 42').	Dec. 22, 1873
Vineyard Haven .....	Aug. 23, 1881	<b>New Hampshire:</b>	
<b>Michigan:</b>	Dec. 18, 1871	Dover Point .....	Jan. 12, 1872
Ann Arbor (University of Michigan).	Nov. 23, 1871	Gorham .....	Mar. 30, 1874
Eagle River .....	Jan. 21, 1882	Iales of Shoals .....	Sept. 10, 1879
Glen Haven .....	June 11, 1881	Manchester .....	Jan. 21, 1873
.....	Dec. 4, 1881	Milton .....	Jan. 8, 1883
.....	Mar. 4, 1883	Mount Kearsarge .....	Oct. 23, 1874
Hillsdale .....	Aug. 6, 1871	Mount Massilank .....	Aug. 16, 1871
Huron City .....	Jan. 27, 1877	<b>New Mexico:</b>	
Lansing (State Agricultural College).	Feb. 19, 1871	Cimarron .....	Dec. 3, 1880
Leland .....	Jan. 12, 1875	<b>New York:</b>	
Mamont Island .....	Dec. 18, 1883	Alfred Centre (Alfred Uni- versity).	Jan. 12, 1877
Niles .....	Feb. 25, 1882	Catskill Mountains .....	June 21, 1883
Paw Paw .....	Oct. 24, 1881	Deposit .....	Apr. 1, 1872
Port Hope .....	July 27, 1881	Ithaca (Cornell University) .....	Aug. 8, 1872
Three Rivers .....	Apr. 8, 1876	.....	Nov. 18, 1872
Whitehall .....	July 22, 1871	.....	Nov. 22, 1872
.....	May 30, 1876	.....	Jan. 25, 1873
.....	Mar. 29, 1879	.....	Jan. 8, 1875
.....	Oct. 6, 1879	.....	Mar. 17, 1875
<b>Minnesota:</b>		.....	Apr. 17, 1875
Breckenridge .....	Feb. 17, 1881	.....	May 7, 1873
Detroit .....	Feb. 2, 1873	.....	Aug. 6, 1876
Minneapolis (University of Minnesota).	Feb. 21, 1872	Long Beach (Long Island) .....	Oct. 16, 1880
New Ulm .....	July 10, 1872	Ogdenburg .....	May 25, 1872
.....	Dec. 15, 1881	Overlook Mountains .....	Mar. 7, 1879
Northfield (Carleton College) ..	May 28, 1879	Plattsburg .....	May 23, 1872
.....	Nov. 19, 1880	Port Jervis .....	Nov. 6, 1881
Reed's Landing .....	June 25, 1877	Sodus Point .....	Feb. 14, 1883
<b>Mississippi:</b>		Starkoy .....	Aug. 6, 1876
Chatawa (College of the Re- demptionist Fathers).	July 12, 1874	Staten Island .....	June 9, 1871
Inka .....	Mar. 25, 1872	.....	June 30, 1871
Macon .....	Jan. 6, 1881	Suspension Bridge (Seminary of our Lady of Angels).	May 14, 1880
Starkville .....	June 25, 1884	Syracuse .....	May 9, 1874
Winona .....	July 20, 1882	.....	May 11, 1874
<b>Missouri:</b>		The Vista (Catskill Mount- ains).	Feb. 6, 1873
Carthage .....	Aug. 15, 1873	Tloonderoga .....	Feb. 21, 1882
Dromore .....	Jan. 27, 1883	Watertown .....	June 21, 1871
Glasgow .....	Mar. 6, 1880	.....	June 21, 1873
Killingham .....	Mar. 21, 1884	Whitestone (Long Island) .....	Mar. 9, 1876
Lamar .....	May 21, 1884	<b>North Carolina:</b>	Dec. 29, 1881
.....		Alleghany Mountains .....	July 26, 1873

*List of places for which stations have been requested, &c.—Continued.*

Place.	Date.	Place.	Date.
<b>North Carolina—Continued.</b>		<b>Tennessee—Continued.</b>	
Beaufort.....	Feb. 10, 1879	Sewanee (University of the South).....	June 10, 1872
	Feb. 15, 1881		June 26, 1877
	July 24, 1883		Apr. 22, 1881
Black Dome (Black Mount- ains).....	Feb. 12, 1873		Dec. 17, 1881
	Dec. 10, 1880	Tennessee Ridge.....	June 13, 1883
	Jan. 28, 1881	<b>Texas:</b>	
Body Island.....	Apr. 17, 1871	Abilene.....	Feb. 26, 1884
Chadbourne.....	July 4, 1883	Belton.....	May 28, 1873
Danville (Mocksville and South- western Railroad).....	July 29, 1881	Caddo Peak.....	Nov. 23, 1883
		Comfort.....	Sept. 2, 1880
Great Natashalee (Bald Mount- ains).....	Apr. 1, 1872		Sept. 6, 1880
			Nov. 15, 1880
Hibritton Mountains.....	Jan. 28, 1881	Fort Worth.....	May 25, 1881
Highlands.....	Dec. 13, 1881	Galveston (north and west of).....	Mar. 6, 1873
	Dec. 29, 1881	Lampasas.....	Feb. 14, 1883
	Dec. 30, 1881	<b>Utah:</b>	
	Feb. 12, 1884	Beaver City.....	July 8, 1872
Lenoir.....	July 28, 1875	Ogden.....	Apr. 28, 1873
Mount Mitchell.....	Aug. 29, 1872	<b>Vermont:</b>	
Mount Stookey.....	Oct. 19, 1882	Acoutney Mountain.....	May 24, 1881
Ocracoke.....	June 29, 1877	Bennington (Mount Anthony).....	Jan. 27, 1873
Roane Mountain.....	July 19, 1878	Northfield (Norwich Univer- sity).....	Mar. 15, 1872
Statesville.....	Nov. 17, 1877		
	Jan. 29, 1879	Randolph (State Normal School)	Mar. 14, 1881
Swansborough.....	Sept. 4, 1879	Stowe.....	Dec. 22, 1876
Winston.....	Mar. 17, 1880	<b>Virginia:</b>	
<b>Ohio:</b>		Bald Knob (Giles County).....	July 21, 1874
Dayton (National Soldiers' Home).....	Feb. 11, 1873		Dec. 22, 1876
	Feb. 1, 1875	Blacksburg.....	Dec. 22, 1883
Hillsborough.....	Sept. 3, 1881	Charlottesville (University of Virginia).....	Mar. 2, 1873
Ironton.....	Mar. 25, 1875		
Kelly's Island.....	May 25, 1876	Christianburg.....	Aug. 15, 1871
	Dec. 17, 1879	Danville.....	Dec. 12, 1873
	Aug. 19, 1880		July 15, 1879
Oxford.....	Feb. 22, 1882		May 23, 1882
	Aug. 5, 1882		May 23, 1879
Springfield.....	Feb. 7, 1881	Elliott's Knob.....	Dec. 27, 1871
Xenia.....	June 30, 1871	Manassas.....	Feb. 17, 1871
<b>Oregon:</b>		Mountains (additional stations on).....	May 17, 1871
Beaver City.....	Feb. 9, 1876	Mount Lake.....	July 21, 1874
Corvallis.....	Jan. 17, 1884	Richmond.....	Apr. 2, 1871
Point Adams.....	Aug. 26, 1880	Staunton.....	Aug. 15, 1871
Tillamook Rock.....	Aug. 26, 1880		Oct. 9, 1882
	Dec. 27, 1880	Winchester.....	Aug. 15, 1871
	Jan. 3, 1881	<b>Washington Territory:</b>	
	June 20, 1881	Cape Disappointment.....	Sept. 30, 1873
	Jan. 31, 1882		Dec. 6, 1881
	Mar. 8, 1882	Cape Hancock.....	Feb. 12, 1882
<b>Pennsylvania:</b>		Port Townsend.....	Mar. 8, 1875
Altoona.....	Feb. 17, 1872		Dec. 16, 1876
Berks (summit of Blue Ridge Mountains).....	Sept. 9, 1881		Dec. 17, 1876
			Mar. 5, 1880
Carlisle.....	May 4, 1876		Oct. 26, 1878
Catasauqua.....	Sept. 11, 1871	Seattle.....	No date.
Chambersburg.....	June 12, 1871	Semiahmoo.....	No date.
Easton.....	Aug. 15, 1871	Walla Walla.....	Feb. 9, 1876
Franklinville.....	Dec. 1, 1882	<b>West Virginia:</b>	
Gallatin.....	Feb. 17, 1872	Ceredo.....	June 10, 1876
Greensborough.....	Dec. 28, 1872		Nov. 21, 1876
	Jan. 10, 1873		Oct. 15, 1883
Harrisburg.....	Aug. 15, 1871	Maywood.....	
	Feb. 26, 1881	Bailey's Harbor.....	Feb. 16, 1882
	Oct. 29, 1881		Apr. 16, 1883
Heilmandale.....	Apr. 1, 1872		Jan. 8, 1883
Hummelstown.....	June 10, 1879	Carlton.....	Jan. 10, 1874
Kutztown (Keystone State Normal School).....	Sept. 13, 1872		Jan. 26, 1874
		Fond du Lac.....	Dec. 15, 1874
Media.....	Oct. 1, 1883	Hingham.....	Apr. 18, 1875
Mount Pisgah (Bradford County).....	Mar. 2, 1875	Janeville.....	Aug. 7, 1881
		Mineral Point.....	Dec. 1, 1873
Mount Pleasant (Mount Pleasant Academy).....	Aug. 11, 1871	Oshkosh.....	Jan. 23, 1875
Tionesta.....	Feb. 9, 1884	Palmyra.....	May 18, 1874
Wilkes Barre.....	Apr. 8, 1881	Prairie du Chien.....	Feb. 27, 1884
		Ripon (Ripon College).....	July 21, 1877
<b>South Carolina:</b>			Feb. 5, 1873
Aiken.....	July 16, 1872		Feb. 23, 1878
	Sept. 2, 1872		Feb. 24, 1881
	Mar. 31, 1875	<b>Wyoming:</b>	
	No date.	Fred Steele, Fort.....	
<b>Tennessee:</b>		<b>Miscellaneous:</b>	
Laurens.....	No date.	Atlantic Ocean.....	Aug. 12, 1883
Bristol.....	Aug. 15, 1871	Chippawayan, Fort (Canada).....	Sept. 11, 1883
Clarksville.....	Dec. 21, 1881	Havana (Cuba).....	Sept. 14, 1883
Moffat.....	Jan. 29, 1876	Prince Albert (North Saskatchewan River, Manitoba).....	Aug. 31, 1883
		State Agricultural College.....	Feb. 23, 1877

## APPENDIX 19.

Meteorological data were furnished 254 different persons during the year ending June 30, 1884, at their request, for the following purposes, viz:

To be used in State or United States courts as evidence.

To be used in compiling works or publications on meteorology, hygiene, agriculture, manufactures, commerce, &c.

To assist in manufactures, the prosecution of the arts, and advancement of the sciences.

To settle questions as to the relations of meteorology and agriculture.

In deciding the cause and locating the responsibility in railroad and marine disasters.

In fixing the responsibility of damage to freight in transit by common carriers.

In acquainting immigrants with the climatology of districts open to settlement.

In informing invalids of the desirability of the meteorology of sections affecting their diseases.

Miscellaneous purposes.

## APPENDIX 20.

*Exhibiting the communications sent from and received at the Signal Office, Washington City  
(exclusive of telegrams), from July 1, 1883, to June 30, 1884.*

### SENT.

To heads of Departments and Bureaus .....	3,418
To non-commissioned officers in charge of stations in reference to their duties .....	9,364
In reply to applications for stations .....	235
To telegraph companies in reference to transmission of weather reports, and the erection of telegraph lines, &c .....	300
To boards of trade, chambers of commerce, &c .....	157
To foreign correspondents relating to simultaneous reports .....	702
To foreign correspondents in general .....	665
To voluntary observers throughout the United States .....	5,032
In relation to enlistments, discharges, &c .....	1,082
In relation to publications .....	2,600
To postmasters relative to "Farmers' Bulletins," &c .....	160
To railroad companies relative to establishing stations, furnishing "indications," &c .....	145
In relation to duties and discipline at Signal Service School of Instruction at Fort Myer, Virginia .....	944
In relation to furnishing meteorological instruments, charts, books, forms, &c .....	277
In relation to building, sale, repair, &c., of telegraph lines .....	63
Orders, instructions, circulars, &c .....	69,750
To manufacturers and others in reference to instruments, equipments, &c .....	2,475
To non-commissioned officers in charge of stations and other enlisted men in reference to property and money accounts .....	12,203
In reference to quarterly returns of officers, &c .....	2,772
Authorizing purchases and expenditures .....	1,792
Miscellaneous .....	11,691
<b>Total .....</b>	<b>125,725</b>

### RECEIVED.

From heads of Departments and Bureaus .....	5,137
Applications for establishment of new stations .....	46
From telegraph companies in reference to the transmission of weather reports and the construction of telegraph lines, &c .....	192
From boards of trade, chambers of commerce, &c .....	102
From foreign correspondents .....	240
Surgeons' certificates .....	503
Examination papers .....	70
From non-commissioned officers in charge of stations in reference to their duties .....	8,708
Returns, accounts, descriptive lists, &c .....	1,291
From foreign correspondents relating to simultaneous weather reports .....	7,053
From United States naval vessels and stations (received through the Navy Department) .....	2,721
From voluntary observers throughout the United States relating to observations and reports .....	3,981
From United States military posts (received through the office of the Surgeon-General) .....	651
Relating to duties and discipline at Signal Service School of Instruction at Fort Myer, Virginia .....	239
Relating to instruction in military signaling .....	72
Applications for enlistment .....	500

Recruiting and enlistment .....	117
Instruction reports of non-commissioned officers and assistants .....	2,250
Reports from railroad stations throughout the United States in reference to weather reports .....	25,208
Meteorological forms, &c., from non-commissioned officers in charge of stations .....	212,957
Reports from postmasters throughout the United States, in reference to weather bulletins .....	103,536
From manufacturers and others, relating to instruments, equipments, &c. ....	1,563
From officers, concerning property, quarterly returns, &c. ....	2,043
From non-commissioned officers in charge of stations, and other enlisted men, relating to property and money accounts .....	19,326
Miscellaneous .....	18,999
<b>Total</b> .....	<b>417,551</b>
<b>Total sent</b> .....	<b>125,723</b>
<b>Total received</b> .....	<b>417,551</b>
<b>Total sent and received</b> .....	<b>543,274</b>

*Table showing the number of cipher words and messages sent and received by telegraph at the Signal Office, Washington City, from July 1, 1883, to June 30, 1884.*

Cipher words of weather reports sent .....	36,500
Telegrams other than weather reports sent .....	9,510
Telegrams on sea-coast lines sent .....	7,200
Cipher words of weather reports on sea-coast lines sent .....	116,070
Cipher words of weather reports received .....	685,490
Telegrams other than weather reports received .....	12,240
Special river cipher words received .....	1,910
Telegrams on sea-coast lines received .....	10,800
Cipher words of weather reports on sea-coast lines received .....	140,300
Mailed reports from non-commissioned officers in charge of stations .....	63,700
<b>Total</b> .....	<b>1,083,720</b>



## APPENDIX 21.

*Classified list of stations of the Signal Service, United States Army, in operation on June 30, 1884.*

[*a.* Displays cautionary signals. *b.* Takes observations of temperature of the water in river or harbor at 2 p. m. (Washington time), daily. *c.* Takes observations of the stage of water in the river at 2 p. m. (Washington time), daily. *d.* Prints Farmers' Bulletins. *e.* Takes cotton-region observation at 5 p. m. (local time), daily. *f.* Fort Myer, Virginia, is maintained as a first-class station whenever a class is under instruction; at other times as a third-class station. *g.* Takes an observation at 8 a. m. (Washington time), daily. *A.* Displays cold-wave signal.]

**Alabama.**—Stations of the first class: Mobile *b, a, e*, Montgomery *e*. Special display station: Fort Morgan. Special river station: Decatur. Special cotton-region stations: Birmingham, Calera, Decatur, Eufaula, Evergreen, Greenville, Fort Deposit, Livingston, Marion, Pine Apple, Opelika, Scottsborough, Selma, Tusculumbia.

**Alaska.**—Stations of the first class: Fort Alexander, Fort Saint Michaela, Sitka, Unalashka. Stations of the second class: Anvik, Atka, Cordova Bay, Hoonah, Hoonyah, Kenai, Koskokvim, Port Etches, Pyramid Harbor, Tananah, Tcha-tow-klin, Fort Wrangell, Yakutat Bay. Stations of the third class: Golovin Bay, Harrisburg (or Juneau City), Mission, Nuduckayet, Nulato, Fort Reliance, Saint George Island, Ugashik.

**Arizona.**—Stations of the first class: Fort Apache, Fort Grant, Prescott *g*, Camp Thomas, Yuma *c*. Stations of the third class: Apache Pass, Maricopa, Fort McDowell, Phoenix, San Carlos Agency, Fort Verde, Wickenburg, Willcox. Station of the fourth class: Ash Fork.

**Arkansas.**—Stations of the first class: Fort Smith *c, e*, Little Rock *c, e, A*. Special river station: Helena *e*. Special cotton-region stations: Arkansas City, Brinkley, Devall's Bluff, Kensett, Madison, Magnolia, Malvern, Monticello, Newport, Pine Bluff, Prescott, Russellville, Texarkana.

**Behring Sea.**—Station of the first class: Behring's Island.

**California.**—Stations of the first class: Cape Mendocino, Los Angeles, Red Bluff *c*, Sacramento *c*, San Diego, San Francisco *b, d, g*. Station of the third class: Fort Bidwell. Special river stations: Colusa, Folsom City, Marysville, Oroville.

**Colorado.**—Stations of the first class: Denver, Pike's Peak, West Las Animas. Stations of the third class: Durango, Montrose.

**Connecticut.**—Stations of the first class: New Haven *b, a*, New London *b, a*. Special display stations: New Haven Light, Stonington.

**Dakota.**—Stations of the first class: Fort Bennett, Bismarck *c, g*, Fort Buford, Deadwood, Huron, Fort Totten, Yankton *c*. Stations of the third class: Fort Meade, Fort Sisseton, Fort Sully, Webster, Fort Yates. Station of the fourth class: Larimore.

**Delaware.**—Station of the first class: Delaware Breakwater *b, a*.

**District of Columbia.**—Station of the first class: Washington *d, g*.

**Florida.**—Stations of the first class: Cedar Keys *b, a, e*, Jacksonville *b, a*, Key West *b, a*, Pensacola *b, a*, Sanford. Special display stations: Fernandina *e*, Fort George Island, Saint Augustine, Sand Key Light. Special cotton-region stations: Live Oak, Waldo.

**Georgia.**—Stations of the first class: Atlanta *c*, Augusta *b, c, e*, Savannah *b, a, e*. Special display stations: Brunswick, Tybee Island. Special cotton-region stations: Albany, Allapaha, Athens, Bainbridge, Camak, Cartersville, Columbus, Dalton, Eastman, Fort Gaines, Gainesville, Griffin, Jessup, Macon, Millen, Newnan, Quitman, Smithville, Thomasville, Toccoa, Union Point, Washington, Way Cross, Wayneborough, West Point.

**Idaho.**—Stations of the first class: Boise City, Lewiston. Station of the third class: Fort Coeur d'Alene.

**Illinois.**—Stations of the first class: Cairo *c*, Chicago *b, a, d, g, A*, Springfield. Special river stations: Mount Carmel, Peoria, Warsaw.

**Indiana.**—Station of the first class: Indianapolis. Special river station: Evansville. Special printing station: Logansport.

**Indian Territory.**—Station of the first class: Fort Sill. Stations of the third class: Cantonment, Fort Reno, Fort Supply.

**Iowa.**—Stations of the first class: Davenport *c*, Des Moines *d*, Dubuque *c*, Keokuk *c*. Special river stations: Le Claire, Muscatine. Special printing station: Burlington.

**Kamitchatka.**—Station of the second class: Petropaulovski.

**Kansas.**—Stations of the first class: Dodge City, Leavenworth *c, d*.

**Kentucky.**—Station of the first class: Louisville *c, A*. Special river station: Paducah.

**Labrador.**—Station of the first class: Fort Chimo, (Ungava Bay).

**Louisiana.**—Stations of the first class: New Orleans *c, a, e*, Shreveport *c, e*. Special river station: Monroe *e*. Special cotton-region stations: Alexandria, Amite City, Cheneyville, Coushatta Chute, Lafayette, Minden, Natchitoches, Opelousas, Whiteville.

**Maine.**—Stations of the first class: Eastport *b, a*, Portland *b, a*. Special display stations: Bath, Boothbay, Rockland, Southwest Harbor. Special printing station: Bangor.

**Maryland.**—Station of the first class: Baltimore *b, a*. Station of the third class: Ocean City.

**Massachusetts.**—Station of the first class: Boston *b, a, d, g*. Station of the third class: Thatcher's Island *a*. Special display stations: Bass River Light, Fall River, Gloucester, Highland Light, Hyannis, Marblehead, New Bedford, Newburyport, Provincetown, Wood's Holl.

**Michigan.**—Stations of the first class: Alpena *b, a*, Detroit *b, a, d*, Escanaba *b, a*, Grand Haven *b, a*, Mackinaw City *b, a*, Marquette *b, a*, Port Huron *a*. Special display stations: Bay City, Charlevoix, East Tawas, Elk Rapids, Frankfort, Ludington, Fort Mackinac, Manistee, Menominee, Montague, Muskegon, Northport, Pentwater, Petoskey, Saint Ignace, Saint Joseph, Sand Beach, South Haven, Traverse City.

**Minnesota.**—Stations of the first class: Duluth *b, a*, Moorhead, Saint Paul *c*, Saint Vincent.

**Mississippi.**—Stations of the first class: Vicksburg *c, e*. Special cotton-region stations: Aberdeen, Batesville, Brookhaven, Columbus, Corinth, Edwards, Grenada, Hazlehurst, Hernando, Holly Springs, Jackson, Lake, Macon, Meridian, Natchez, Okolone, Oxford, Waynesborough.

**Missouri.**—Stations of the first class: Saint Louis *c, d, g, A*. Special river stations: Boonville, Brunswick, Hermann, Jefferson City, Kansas City, Lexington, Saint Joseph.

**Montana.**—Stations of the first class: Fort Assinaboine, Fort Benton *c*, Fort Custer, Helena, Fort Maginnis, Poplar River, Fort Shaw. Stations of the fourth class: Glendive, Terry's Landing.

**Nebraska.**—Stations of the first class: North Platte, Omaha *a*. Special river station: Plattsmouth.

**New Hampshire.**—Station of the first class: Mount Washington. Special display station: Portsmouth.

**New Jersey.**—Stations of the first class: Atlantic City *b, a*, Barnegat City *a*, Cape May *a*, Sandy Hook *b, a*. Station of the third class: Little Egg Harbor *a*.

**New Mexico.**—Stations of the third class: Fort Craig, Florida Station, San Marcial, Fort Stanton, Watrous.

**New York.**—Stations of the first class: Albany *d, A*, Buffalo *b, a, d, g, A*, New York City *b, a, d, g*, Oswego *a*, Rochester. Special display stations: Cape Vincent, Charlotte, City Island, Dunkirk, Fire Island, North Fair Haven.

**North Carolina.**—Stations of the first class: Charlotte *c*, Hatteras *a*, Kittyhawk *a, g*, Fort Macon *a*, Smithville *b, a*, Wilmington *b, a, e*. Stations of the third class: New River Inlet, Scott's Hill, Wash Woods. Special cotton-region stations: Goldsborough, Lumberton, New Berne, Raleigh, Salisbury, Wadesborough, Weldon.

**Ohio.**—Stations of the first class: Cincinnati *c, d, g, A*, Cleveland *b, a*, Columbus, Sandusky *b, a*, Toledo *b, a*. Special river station: Marietta. Special display station: Ashtabula.

**Oregon.**—Stations of the first class: Portland *c, b*, Roseburg. Stations of the third class: Ashland, Astoria, Fort Klamath, Lake View, Linkville. Special river stations: Albany, Eugene City, Umatilla.

**Pennsylvania.**—Stations of the first class: Erie *a*, Philadelphia *d, g*, Pittsburgh *c, d, g*. Special river stations: Brownsville, Confluence, Freeport, Mahoning, New Geneva, Oil City, Saltsburg.

**Rhode Island.**—Station of the first class: Block Island *b, a*. Stations of the third class: Narragansett Pier, Point Judith *a*. Special display stations: Bristol, Newport, Southeast Light, Block Island.

**South Carolina.**—Station of the first class: Charleston *b, a, e*. Special display station: Port Royal. Special cotton-region stations: Allendale, Anderson, Batesburg, Blackville, Branchville, Cheraw, Chester, Columbia, Florence, Greenville, Greenwood, Hardeeville, Jacksonborough, Kingstree, Saint George's, Saint Matthew's, Spartanburg, Yemassee.

**Tennessee.**—Stations of the first class: Chattanooga *c, A*, Knoxville *c*, Memphis *c, e*, Nashville *c, d, e, A*. Special river stations: Charleston, Clinton, Johnsonville, Kingston, Leadvale, London, Rockwood, Strawberry Plains. Special cotton-region stations:

**Bolivar, Brownsville, Covington, Dyersburg, Grand Junction, Milan, Paris, Withe.**  
**Texas.**—Stations of the first class: Brownsville, Fort Concho, Fort Davis, Fort Elliott, El Paso, Galveston *b, a, c*, Indianola *b, a*, Palestine *c*, Rio Grande City, Fort Stockton. Stations of the third class: Henrietta, Marfa. Special display station: Corpus Christi. Special cotton-region stations: Austin, Beaumont, Belton, Columbia, Corsicana, Cuero, Dallas, Hearne, Hempstead, Houston, Huntsville, Longview, Luling, Orange, Paris, San Antonio, Sour Lake, Tyler, Waco, Weatherford, Weimar.

**Utah.**—Station of the first class: Salt Lake City. Station of the third class: Fort Thornburg.

**Virginia.**—Stations of the first class: Cape Henry *a*, Chincoteague *b, a*, Lynchburg, Fort Myer, *f*, Norfolk *b, a*. Special display station: Fort Monroe.

**Washington Territory.**—Stations of the first class: Fort Canby *b*, Dayton, Olympia, Spokane Falls, Tatoosh Island. Stations of the third class: Neah Bay, Port Angeles, Pysht, Fort Spokane. Stations of the fourth class: Crescent Bay, Hoko.

**West Virginia.**—Special river station: Wheeling.

**Wisconsin.**—Stations of the first class: La Crosse *c*, Milwaukee *b, a*. Special display stations: Ahnapee, Green Bay, Kenosha, Kewaunee, Manitowoc, Racine, Sheboygan, Sturgeon Bay.

**Wyoming.**—Station of the first class: Cheyenne. Station of the third class: Fort Bridger. Station of the fourth class: Carter.

*List of full reporting stations opened during the year ending June 30, 1884.*

Canby, Fort, Wash.  
 Custer Fort, Mont. (re-established).  
 Rio Grande City, Tex. (re-established).  
 Rochester, N. Y. (re-established).

Sandusky, Ohio (re-established).  
 Tatoosh Island, Wash.  
 Totten, Fort, Dak.

*List of full reporting stations discontinued during the year ending June 30, 1884.*

Coleman City, Tex.  
 Henrietta, Tex.  
 Ooglaamie (Point Barrow), Alaska.

Portsmouth, N. C.  
 Provincetown, Mass.  
 Verde, Fort, Ariz.

## APPENDIX 22.

SIGNAL SERVICE STATIONS IN OPERATION JUNE 30, 1884.

[a Displays cautionary signals. b Takes observation of temperature of the water in river or harbor at 2 p. m. (Washington time) daily. c Takes observation of the stage of water in the river at 2 p. m. (Washington time) daily. d Prints Farmers' Bulletin. e Takes cotton-region observation at 5 p. m. (local time) daily. f Fort Myer, Va., is maintained as a first-class station whenever a class is under instruction; at other times as a third-class station. A Displays cold-wave signal.]

*Stations of the first order making a continuous record by means of self-registering instruments.*

Washington, D. C. d

*Stations of the second order taking six observations daily, reporting three times a day by telegraph and monthly by mail.*

Bismarck, Dak. c	Cincinnati, Ohio c, d, h	Pittsburgh, Pa. c, d
Boston, Mass. b, a, d	Kitty Hawk, N. C. a	Prescott, Ariz.
Buffalo, N. Y. b, a, d, h	New York City b, a, d	Saint Louis, Mo. c, d, h
Chicago, Ill. b, a, d, h	Philadelphia, Pa. d	San Francisco, Cal. b, d

*Stations of the second order taking five observations daily, reporting three times a day by telegraph and monthly by mail.*

Albany, N. Y. d, h	Escanaba, Mich. b, a	North Platte, Nebr.
Alpena, Mich. b, a	Fort Smith, Ark. c, e	Olympia, Wash.
Atlanta, Ga. e	Galveston, Tex. b, a, e	Omaha, Nebr. c
Atlantic City, N. J. b, a	Grand Haven, Mich. b, a	Oswego, N. Y. a
Augusta, Ga. b, c, e	Hatteras, N. C. a	Palestine, Tex. e
Baltimore, Md. b, a	Huron, Dak.	Pensacola, Fla. b, a
Barneget City, N. J. a	Indianapolis, Ind.	Port Huron, Mich. a
Block Island, R. I. b, a	Indianola, Tex. b, a	Portland, Me. b, a
Cairo, Ill. c	Jacksonville, Fla. b, a	Portland, Oreg. c, b
Cape Henry, Va. a	Keokuk, Iowa. c	Red Bluff, Cal. c
Cedar Keys, Fla. b, a, e	Key West, Fla. b, a	Rio Grande City, Tex.
Charleston, S. C. b, a, e	Knoxville, Tenn. c	Rochester, N. Y.
Charlotte, N. C. c	La Crosse, Wis. c	Roseburg, Oreg.
Chattanooga, Tenn. c, h	Leavenworth, Kans. c, d	Sacramento, Cal. c
Cheyenne, Wyo.	Little Rock, Ark. c, e, h	Saint Paul, Minn. c
Chincoteague, Va. b, a	Los Angeles, Cal.	Saint Vincent, Minn.
Cleveland, Ohio b, a	Louisville, Ky. c, h	Salt Lake City, Utah
Columbus, Ohio.	Lynchburg, Va.	San Diego, Cal.
Concho, Fort, Tex.	Mackinaw City, Mich. b, a	Sandusky, Ohio. b, a
Custer, Fort, Mont.	Macon, Fort, N. C. a	Sandy Hook, N. J. b, a
Davenport, Iowa. c	Marquette, Mich. b, a	Sanford, Fla.
Deadwood, Dak.	Memphis, Tenn. c, e	Savannah, Ga. b, a, e
Delaware Breakwater,	Milwaukee, Wis. b, a	Shreveport, La. c, e
Del. b, a	Mobile, Ala. b, a, e	Smithville, N. C. b, a
Denver, Colo.	Montgomery, Ala. c	Springford, Ill.
Des Moines, Iowa, d	Mount Washington, N. H.	Toledo, Ohio, b, a
Detroit, Mich. b, a, d	Moorhead, Minn.	Vicksburg, Miss. c, e
Dodge City, Kans.	Nashville, Tenn. c, d, e, h	West Las Animas, Colo.
Eastport, Me. b, a	New Haven, Conn. b, a	Wilmington, N. C. b, a, e
El Paso, Tex.	New Orleans, La. c, a, e	Yankton, Dak. c
Erie, Pa. a	Norfolk, Va. b, a	Yuma, Ariz. c

*Taking five observations daily, reporting once a day by telegraph and monthly by mail.*

Dubuque, Iowa. c

*Taking five observations daily, and reporting monthly by mail.*

Boise City, Idaho.	Myer, Fort, Va. f	Pike's Peak, Colo.
Chimo, Fort (Ungava Bay), Labrador.	New London, Conn. b, a	Sitka, Alaska.

*Taking three observations daily, reporting three times a day by telegraph and monthly by mail.*

Apache, Fort, Ariz.	Cape Mendocino, Cal.	Shaw, Fort, Mont.
Assinaboine, Fort, Mont.	Duluth, Minn. b, a	Sill, Fort, Ind. T.
Bennett, Fort, Dak.	Elliott, Fort, Tex.	Spokane Falls, Wash.
Benton, Fort, Mont. c	Helena, Mont.	Stockton, Fort, Tex.
Brownsville, Tex.	Lewiston, Idaho.	Tatoosh Island, Wash.
Buford, Fort, Dak.	Maginnis, Fort, Mont.	Totten, Fort, Dak.
Canby, Fort, Wash. b	Poplar River, Mont.	

*Taking three observations daily, and reporting monthly by mail.*

Alexander, Fort, Alaska.	Davis, Fort, Tex.	Thomas, Camp, Ariz.
Behring's Island, Behring Sea.	Dayton, Wash.	Unalashka, Alaska.
Cape May, N. J. a	Grant, Fort, Ariz.	
	Saint Michael's, Fort, Alaska.	

*Stations of the third order.—Taking two observations daily (at 3 p. m. and 11 p. m., Washington time), and reporting monthly by mail.*

Anvik, Alaska.	Kenai, Alaska.	Pyramid Harbor, Alaska.
Atka, Alaska.	Koskukvim, Alaska.	Tanana, Alaska.
Cordova Bay, Alaska.	Petropaulovski, Kamtchatka.	Toha-tow-kin, Alaska.
Hoonah, Alaska.	Port Etches, Alaska.	Wrangell, Fort, Alaska.
Hoonyah, Alaska.		Yakutat Bay, Alaska.

*Taking one observation daily (at the hour of sunset), and reporting monthly by mail.*

Apache Pass, Ariz.	Mariocopa, Ariz.	San Marcial, N. Mex.
Ashland, Oreg.	McDowell, Fort, Ariz.	Scott's Hill, N. C.
Astoria, Oreg.	Meade, Fort, Dak.	Sisseton, Fort, Dak.
Bidwell, Fort, Cal.	Mission, Alaska.	Spokane, Fort, Wash.
Bridger, Fort, Wyo.	Montrose, Colo.	Stanton, Fort, N. Mex.
Cantonment, Ind. T.	Narragansett Pier, R. I.	Sully, Fort, Dak.
Cœur d'Alene, Fort, Idaho.	Neah Bay, Wash.	Supply, Fort, Ind. T.
Craig, Fort, N. Mex.	New River Inlet, N. C.	Thatcher's Island, Mass. a
Durango, Colo.	Nuduckayet, Alaska.	Thornburg, Fort, Utah.
Florida Station, N. Mex.	Nulato, Alaska.	Ugashik, Alaska.
Golovin Bay, Alaska.	Ocean City, Md.	Verde, Fort, Ariz.
Harrisburg (or Juneau City), Alaska.	Phoenix, Ariz.	Wash Woods, N. C.
Henrietta, Tex.	Point Judith, R. I. a	Watrous, N. Mex.
Klamath, Fort, Oreg.	Port Angeles, Wash.	Webster, Dak.
Lakeview, Oreg.	Pysht, Wash.	Wickenburg, Ariz.
Linkville, Oreg.	Reliance, Fort, Alaska.	Willcox, Ariz.
Little Egg Harbor, N. J. a	Reno, Fort, Ind. T.	Yates, Fort, Dak.
Marfa, Tex.	Saint George Island, Alaska.	
	San Carlos Agency, Ariz.	

*Repair stations on the United States military telegraph lines at which no observations are taken.*

Ash Fork, Ariz.	Glendive, Mont.	Larimore, Dak.
Carter, Wyo.	Hoko, Wash.	Terry's Landing, Mont.
Crescent Bay, Wash.		

*Special printing stations.*

Bangor, Me.	Burlington, Iowa.	Logansport, Ind.
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*Display stations.*

Ahnapee, Wis.	Highland Light, Mass.	Petoskey, Mich.
Ashtabula, Ohio.	Hyannis, Mass.	Port Royal, S. C.
Bass River Light, Mass.	Kenosha, Wis.	Portsmouth, N. H.
Bath, Me.	Kewaunee, Wis.	Provincetown, Mass.
Bay City, Mich.	Ludington, Mich.	Racine, Wis.
Boothbay, Me.	Mackinac, Fort, Mich.	Rockland, Me.
Bristol, R. I.	Manistee, Mich.	Saint Augustine, Fla.
Brunswick, Ga.	Manitowoc, Wis.	Saint Ignace, Mich.
Cape Vincent, N. Y.	Marblehead, Mass.	Saint Joseph, Mich.
Charlevoix, Mich.	Menominee, Mich.	Sand Beach, Mich.
Charlotte, N. Y.	Monroe, Fort, Va.	Sand Key Light, Fla.
City Island, N. Y.	Montagne, Mich.	Sheboygan, Wis.
Corpus Christi, Tex.	Morgan, Fort, Ala.	Southeast Light, Block Island, R. I.
Dunkirk, N. Y.	Muskegon, Mich.	South Haven, Mich.
East Tawas, Mich.	New Bedford, Mass.	Southwest Harbor, Me.
Elk Rapids, Mich.	Newburyport, Mass.	Stonington, Conn.
Fall River, Mass.	New Haven Light, Conn.	Sturgeon Bay, Wis.
Fire Island, N. Y.	Newport, R. I.	Traverse City, Mich.
Fort George Island, Fla.	North Fair Haven, N. Y.	Tybee Island, Ga.
Frankfort, Mich.	Northport, Mich.	Wood's Holl, Mass.
Gloucester, Mass.	Pentwater, Mich.	
Green Bay, Wis.		

*Special river stations.*

[Observations of the stage of water in the river are taken at 2 p. m. (Washington time) daily.]

Albany, Oreg.	Jefferson City, Mo.	Oil City, Pa.
Boonville, Mo.	Johnsonville, Tenn.	Oroville, Cal.
Brownsville, Pa.	Kansas City, Mo.	Paducah, Ky.
Brunswick, Pa.	Kingston, Tenn.	Peoria, Ill.
Charleston, Tenn.	Leadvale, Tenn.	Plattsmouth, Nebr.
Clinton, Tenn.	Le Claire, Iowa.	Rockwood, Tenn.
Colusa, Cal.	Lexington, Mo.	Saint Joseph, Mo.
Confluence, Pa.	London, Tenn.	Saltsburg, Pa.
Decatur, Ala.	Mahoning, Pa.	Strawberry Plains, Tenn.
Eugene City, Oreg.	Marietta, Ohio.	Umatilla, Oreg.
Evansville, Ind.	Marysville, Cal.	Warsaw, Ill.
Folsom City, Cal.	Mount Carmel, Ill.	Wheeling, W. Va.
Freeport, Pa.	Muscatine, Iowa.	
Hermann, Mo.	New Geneva, Pa.	

## SPECIAL COTTON REGION STATIONS AND CENTERS.

[One observation made daily at 5 p. m. (central time).]

*Wilmington, N. C. (center).*

Cheraw, S. C.	Lumberton, N. C.	Salisbury, N. C.
Florence, S. C.	New Berne, N. C.	Wadesborough, N. C.
Goldesborough, N. C.	Raleigh, N. C.	Weldon, N. C.

*Charleston, S. C. (center).*

Branchville, S. C.	Kingstree, S. C.	Saint Matthew's, S. C.
Hardeeville, S. C.	Saint George's, S. C.	Yemassee, S. C.
Jacksonborough, S. C.		

*Augusta, Ga. (center).*

Allendale, S. C.	Camak, Ga.	Union Point, Ga.
Athens, Ga.	Chester, S. C.	Washington, Ga.
Batesburg, S. C.	Columbia, S. C.	Waynesborough, Ga.
Blackville, S. C.	Greenwood, S. C.	

*Savannah, Ga. (center).*

Albany, Ga.  
 Allapaha, Ga.  
 Bainbridge, Ga.  
 Eastman, Ga.  
 Fernandina, Fla. c

Fort Gaines, Ga.  
 Jessup, Ga.  
 Live Oak, Fla.  
 Millen, Ga.  
 Quitman, Ga.

Smithville, Ga.  
 Thomasville, Ga.  
 Waldo, Fla.  
 Way Cross, Ga.

*Atlanta, Ga. (center).*

Anderson, S. C.  
 Cartersville, Ga.  
 Columbus, Ga.  
 Dalton, Ga.

Gainesville, Ga.  
 Greenville, S. C.  
 Griffin, Ga.  
 Macon, Ga.

Newnan, Ga.  
 Spartanburgh, S. C.  
 Toocoa, Ga.  
 West Point, Ga.

*Montgomery, Ala. (center).*

Birmingham, Ala.  
 Calera, Ala.  
 Eufaula, Ala.

Fort Deposit, Ala.  
 Greenville, Ala.  
 Marion, Ala.

Opelika, Ala.  
 Pine Apple, Ala.  
 Selma, Ala.

*Mobile, Ala. (center).*

Aberdeen, Miss.  
 Columbus, Miss.  
 Evergreen, Ala.

Livingston, Ala.  
 Macon, Miss.  
 Meridian, Miss.

Okolona, Miss.  
 Waynesborough, Miss.

*New Orleans, La. (center).*

Alexandria, La.  
 Amite City, La.  
 Brookhaven, Miss  
 Cheneyville, La.

Coushatta Chute, La.  
 Hazlehurst, Miss.  
 Lafayette, La.  
 Minden, La.

Natchez, Miss.  
 Natchitoches, La.  
 Opelousas, La.  
 Whiteville, La.

*Galveston, Tex. (center).*

Austin, Tex.  
 Beaumont, Tex.  
 Belton, Tex.  
 Columbia, Tex.  
 Corsicana, Tex.  
 Cuero, Tex.  
 Dallas, Tex.

Hearne, Tex.  
 Hempstead, Tex.  
 Houston, Tex.  
 Huntsville, Tex.  
 Longview, Tex.  
 Luling, Tex.  
 Orange, Tex.

San Antonio, Tex.  
 Sour Lake, Tex.  
 Tyler, Tex.  
 Waco, Tex.  
 Weatherford, Tex.  
 Weimar, Tex.

*Vicksburg, Miss. (center).*

Edwards, Miss.  
 Jackson, Miss.

Lake, Miss.

Monroe, La. c

*Little Rock, Ark. (center).*

Arkansas City, Ark.  
 Brinkley, Ark.  
 Devall's Bluff, Ark.  
 Helena, Ark. c  
 Kensett, Ark.

Madison, Ark.  
 Magnolia, Ark.  
 Malvern, Ark.  
 Monticello, Ark.  
 Newport, Ark.

Paris, Tex.  
 Pine Bluff, Ark.  
 Prescott, Ark.  
 Russellville, Ark.  
 Texarkana, Ark.

*Memphis, Tenn. (center).*

Batesville, Miss.  
 Bolivar, Tenn.  
 Brownsville, Tenn.  
 Corinth, Miss.  
 Covington, Tenn.  
 Decatur, Ala.

Dyersburg, Tenn.  
 Grand Junction, Tenn.  
 Grenada, Miss.  
 Hernando, Miss.  
 Holly Springs, Miss.  
 Milan, Tenn.

Oxford, Miss.  
 Paris, Tenn.  
 Scottsborough, Ala.  
 Tusculmbia, Ala.  
 Withe, Tenn.

## RECAPITULATION.

Stations taking 6 observations daily, reporting three times a day by telegraph and monthly by mail.....	13
Stations taking 5 observations daily, reporting three times a day by telegraph and monthly by mail.....	92
Stations taking 5 observations daily, reporting once a day by telegraph and monthly by mail.....	1
Stations taking 5 observations daily and reporting monthly by mail.....	6
Stations taking 3 observations daily, reporting three times a day by telegraph and monthly by mail.....	20
Stations taking 3 observations daily and reporting monthly by mail.....	9
Stations at which 2 observations are taken daily.....	14
Stations at which 1 observation is taken daily.....	54
Special printing stations.....	3
Display stations.....	64
Special river stations.....	42
Special cotton-region stations.....	138
Stations of observation at which the stage of water in the river is observed daily.....	29
Stations of observation at which the temperature of the water in the river or harbor is observed daily.....	41
Stations of observation at which cotton-region observations are taken daily at 5 p. m.....	18
Stations of observation which display the cautionary signal.....	50
Stations of observation which display the cold-wave signal.....	10
Stations of observation at which the "Farmers' Bulletin" is printed.....	15
Repair stations on the United States military telegraph lines, at which no observations are taken.....	7
Total number of stations.....	463
Total number of stations at which cotton-region observations are taken.....	156
Total number of stations displaying cautionary signals.....	114
Total number of river stations.....	71
Total number of printing stations.....	18

*Comparative summary showing the number of Signal-Service stations in operation on June 30, 1883, and June 30, 1884, respectively.*

	June 30, 1883.	June 30, 1884.
Stations taking six observations daily, reporting three times a day by telegraph and monthly by mail.....		13
Stations taking five observations daily, reporting three times a day by telegraph and monthly by mail.....	108	92
Stations taking five observations daily, making full reports once a day by telegraph and monthly by mail.....	1	1
Stations taking five observations daily and reporting monthly by mail.....	7	6
Stations taking three observations daily, reporting three times a day by telegraph and monthly by mail.....	15	20
Stations taking three observations daily and reporting monthly by mail.....	14	9
Special printing stations.....	8	8
Stations of observation at which the Farmers' Bulletin was printed.....	15	15
Stations at which two observations were taken daily.....	18	14
Stations at which one observation was taken daily.....	29	54
Display stations.....	7	64
Stations of observation displaying the cautionary signal.....	50	50
Stations of observation at which the cold-wave signal was displayed.....		12
Special river stations.....	30	42
Stations of observation at which the stage of water in the river was observed daily.....	28	29
Stations of observation at which the temperature of the water in the river or harbor was observed daily.....	41	41
Repair stations on the United States military telegraph lines, at which no observations were taken.....	27	7
Cotton-region stations.....	124	138
Total number of stations.....	876	468



## APPENDIX 23.

Monthly and annual mean barometer reduced to sea-level at stations of the Signal Service, United States Army, for the year ending June 30, 1894 (deduced from observations taken at 7 a. m., 3 and 11 p. m., Washington time).

[The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. observations by three; the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	Elevation of barometer station above mean sea-level.	1893.												1894.				Annual mean.
		July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.					
Albany N. Y.	83	29.954	30.033	30.063	30.178	30.019	30.107	30.099	30.086	30.051	29.990	29.966	30.081	30.051	30.070	30.070	30.070	30.051
Alexander, Fort, Alaska.	39	29.921	30.017	30.060	30.130	30.049	30.251	30.283	30.228	30.095	30.044	29.944	30.079	30.044	30.079	30.079	30.079	30.044
Alpena, Mich.	608	29.838	29.939	29.984	29.987	30.145	30.128	30.179	30.074	29.943	29.943	29.940	29.940	29.940	29.940	29.940	29.940	29.940
Apache, Fort, Ariz.	5,050 B	29.919	29.947	30.110	30.063	30.065	30.247	30.275	30.218	30.100	30.054	29.979	29.984	30.054	29.984	29.984	29.984	30.054
Ashtabula, Fort, Mont.	2,720 B	29.096	30.061	30.082	30.142	30.254	30.214	30.246	30.147	30.060	29.990	29.940	30.027	30.060	30.027	30.027	30.027	30.060
Atlanta, Ga.	129	29.981	30.128	30.058	30.140	30.152	30.105	30.113	30.057	30.052	29.940	29.943	30.043	30.040	30.043	30.040	30.040	30.043
Atlantic City, N. J.	18	30.067	30.068	30.071	30.138	30.253	30.207	30.256	30.149	30.100	29.981	30.015	30.063	30.015	30.063	30.015	30.015	30.063
Augusta, Ga.	183	30.011	30.059	30.088	30.188	30.202	30.154	30.174	30.108	30.060	29.909	29.979	30.091	30.060	30.091	30.060	30.060	30.091
Baltimore, Md.	45	29.885	30.034	30.069	30.153	30.154	30.107	30.183	30.072	30.015	29.847	29.954	30.081	30.015	30.081	30.015	30.015	30.081
Barnegat City, N. J.	22	29.857	29.936	29.795	29.628	29.587	29.583	29.585	29.590	29.599	29.764	29.681	29.956	29.599	29.956	29.599	29.599	29.764
Behring's Island, Behring Sea.	20	30.924	30.964	30.077	30.049	30.091	30.251	30.283	30.228	30.095	30.044	29.944	30.079	30.044	30.079	30.079	30.079	30.044
Bennett, Fort, Dak.	1,510 B	29.835	30.041	30.135	30.109	30.125	30.240	30.278	30.248	30.109	30.044	29.944	30.079	30.044	30.079	30.079	30.079	30.044
Benton, Fort, Mont.	2,661 B	29.886	29.970	30.065	30.071	30.126	30.247	30.275	30.218	30.071	30.062	29.955	30.084	30.062	30.084	30.062	30.062	30.084
Blanton, Dak.	1,694	29.972	30.028	30.083	30.162	30.136	30.079	30.107	30.070	29.983	29.906	29.947	30.091	29.983	30.091	29.983	29.983	30.091
Black Island, R. I.	2,750 B	29.877	29.911	29.963	30.054	30.203	30.315	30.302	30.146	29.983	29.914	29.947	30.045	29.983	30.045	29.983	29.983	30.045
Boise City, Idaho.	125	29.842	30.012	30.069	30.173	30.097	30.057	30.086	30.060	29.968	29.909	29.937	30.036	29.968	30.036	29.968	29.968	30.036
Boston, Mass.	69	30.040	30.044	30.042	30.071	30.078	30.118	30.242	30.047	29.907	29.900	29.922	30.036	29.900	30.036	29.900	29.900	30.036
Brownsville, Tex.	69	29.838	30.081	30.058	30.133	30.058	30.069	30.190	30.087	30.047	29.947	29.924	30.036	29.947	30.036	29.947	29.947	30.036
Buffalo, N. Y.	680	29.946	29.987	30.099	30.047	30.066	30.258	30.271	30.235	30.086	30.067	29.927	30.065	30.067	30.065	30.065	30.065	30.067
Bufford, Fort, Dak.	1,930 B	30.079	30.086	30.087	30.108	30.224	30.191	30.295	30.110	30.060	30.074	29.999	30.044	30.060	30.044	30.044	30.044	30.060
Calve, Ill.	179	30.038	30.041	30.017	30.038	30.101	30.093	30.090	30.028	29.931	29.944	30.049	30.065	29.931	30.065	30.065	30.065	30.049
Camp, Fort, Wash.	16	30.038	30.041	30.017	30.038	30.101	30.093	30.090	30.028	29.931	29.944	30.049	30.065	29.931	30.065	30.065	30.065	30.049
Cape Henry, Va.	67	29.883	30.079	30.083	30.159	30.159	30.151	30.164	30.101	30.049	29.906	29.985	30.067	29.906	30.067	29.906	29.906	30.067
Cape Mendocino, Cal.	937	30.038	30.041	30.017	30.038	30.101	30.093	30.090	30.028	29.931	29.944	30.049	30.065	29.931	30.065	30.065	30.065	30.049
Cedar Key, Fla.	23	30.014	30.039	30.051	30.068	30.103	30.183	30.239	30.148	30.091	30.039	30.067	30.039	30.039	30.067	30.039	30.039	30.067
Charleston, S. C.	52	30.041	30.023	30.019	30.068	30.202	30.167	30.239	30.118	30.071	29.939	29.967	30.039	30.071	30.039	30.039	30.039	30.067
Charlotte, N. C.	908	30.044	30.043	30.087	30.144	30.236	30.149	30.194	30.134	30.065	29.943	29.984	30.041	30.065	30.041	30.041	30.041	30.065

783	30.069	30.064	30.070	30.126	30.250	30.310	30.261	30.135	30.072	30.972	30.090	30.101	30.028
4, 106	29.847	29.894	30.043	30.008	30.206	30.268	30.223	30.109	30.024	29.988	29.819	29.944	30.028
6, 961	29.072	30.032	30.053	30.006	30.090	30.127	30.160	30.044	30.024	29.988	29.960	29.944	30.028
8	30.018	30.032	30.055	30.007	30.180	30.199	30.149	30.066	30.027	29.976	29.960	29.944	30.028
620	30.042	30.068	30.063	30.120	30.094	30.169	30.216	30.076	30.059	30.050	29.976	30.059	30.028
800	30.042	30.068	30.063	30.120	30.094	30.169	30.216	30.076	30.059	30.050	29.976	30.059	30.028
805	30.018	30.032	30.055	30.007	30.180	30.199	30.149	30.066	30.027	29.976	29.960	29.944	30.028
1,000 B	30.022	30.005	30.073	30.057	30.173	30.144	30.184	30.057	30.041	30.988	30.987	30.987	30.055
5, 040 B	29.970	29.831	30.073	30.059	30.121	30.253	30.276	30.176	30.030	29.976	29.960	29.944	30.028
5, 040 B	29.970	29.831	30.073	30.059	30.121	30.253	30.276	30.176	30.030	29.976	29.960	29.944	30.028
4, 228 B	30.000	29.927	30.066	30.031	30.092	30.194	30.244	30.116	30.009	29.941	29.877	29.877	30.055
4, 600 B	30.000	29.927	30.066	30.031	30.092	30.194	30.244	30.116	30.009	29.941	29.877	29.877	30.055
2, 264	30.006	30.045	30.058	30.131	30.177	30.131	30.151	30.095	30.069	30.047	29.915	30.045	30.028
5, 249	29.823	29.878	30.073	30.046	30.117	30.236	30.248	30.116	30.002	29.923	29.898	29.898	30.028
661	29.875	30.053	30.053	30.113	30.094	30.168	30.139	30.107	30.045	29.927	29.892	29.892	30.044
2, 617	29.820	29.866	30.038	30.037	30.176	30.261	30.277	30.135	30.030	29.927	29.892	29.892	30.044
665	29.850	30.044	30.054	30.101	30.090	30.129	30.208	30.120	30.049	29.927	29.892	29.892	30.044
61	29.801	29.859	30.033	30.136	30.039	29.864	30.047	30.049	30.047	29.973	29.900	29.900	30.044
2, 630 B	29.804	29.841	30.026	30.125	30.025	30.222	30.260	30.119	29.988	29.945	29.915	29.915	30.044
2, 764 B	29.801	29.830	30.026	30.125	30.025	30.222	30.260	30.119	29.988	29.945	29.915	29.915	30.044
681	29.805	30.041	30.064	30.118	29.995	30.061	30.110	30.079	30.040	29.927	29.904	29.904	30.044
613	29.805	30.041	30.064	30.118	29.995	30.061	30.110	30.079	30.040	29.927	29.904	29.904	30.044
451	30.027	30.041	30.053	30.036	30.155	30.160	30.284	30.065	30.005	29.945	29.904	29.904	30.044
40	30.081	30.027	30.053	30.011	30.116	30.129	30.250	30.090	30.015	29.968	29.921	29.921	30.044
4, 856 B	30.043	30.043	30.053	30.086	30.040	30.063	30.115	30.033	30.029	29.960	29.921	29.921	30.044
12	30.018	29.827	30.033	30.107	30.097	30.142	30.168	30.054	29.989	29.923	29.788	29.788	30.044
4, 044 B	29.846	30.055	30.055	30.104	30.073	30.151	30.166	30.106	30.046	29.897	29.788	29.788	30.044
1, 365	29.878	30.075	30.075	30.104	30.073	30.151	30.166	30.106	30.046	29.897	29.788	29.788	30.044
753	30.040	30.033	30.033	30.080	30.151	30.126	30.178	30.050	30.030	29.838	29.846	29.846	30.044
26	30.035	30.040	30.040	30.015	30.129	30.145	30.178	30.038	29.999	29.851	29.862	29.862	30.044
43	30.101	30.043	30.030	30.072	30.192	30.187	30.266	30.137	30.100	29.876	29.944	29.944	30.044
618	30.042	30.042	30.042	30.068	30.120	30.187	30.235	30.069	30.031	29.844	29.944	29.944	30.044
9	30.051	30.065	30.065	30.135	30.218	30.175	30.178	30.128	30.108	29.891	30.021	30.021	30.044
969	30.061	30.066	30.066	30.125	30.218	30.175	30.178	30.128	30.108	29.891	30.021	30.021	30.044
735	29.824	30.022	30.063	30.101	30.043	30.114	30.164	30.131	30.068	29.966	29.903	29.903	30.044
843	29.854	30.053	30.059	30.071	30.144	30.177	30.200	30.117	30.021	29.964	29.903	29.903	30.044
780 B	29.855	30.055	30.058	30.086	30.106	30.178	30.201	30.126	30.051	29.948	29.971	29.971	30.044
290	30.048	30.055	30.058	30.060	30.190	30.178	30.287	30.065	30.034	29.966	29.903	29.903	30.044
871	29.894	29.895	29.892	30.003	30.072	30.106	30.145	30.038	30.034	29.954	29.974	29.974	30.044
580	30.023	30.031	30.023	30.068	30.177	30.141	30.177	30.048	30.034	29.927	29.964	29.964	30.044
653	30.026	30.045	30.061	30.148	30.211	30.161	30.158	30.092	30.047	29.927	29.964	29.964	30.044
605	29.824	30.021	30.065	30.128	29.962	30.033	30.073	30.066	30.061	30.002	29.819	29.819	30.028

\* No record.  
 \*\* Record incomplete.

\* For 26 days only.  
 \* Observations began September 1, 1883.  
 \* For 25 days only.  
 \* Observations recommenced July 21, 1883.

\* For 30 days only.  
 \* For 28 days only.  
 \* For 19 days only.  
 \* For 27 days only.



301	32,911	32,907	30,054	30,038	30,019	30,126	30,195	30,097	30,037	29,973	30,009	29,935	30,031
302	32,885	32,980	30,057	30,090	30,013	30,124	30,258	30,319	30,080	30,045	30,038	30,039	30,035
303	32,837	32,877	30,030	30,040	30,284	30,243	30,246	30,153	30,098	30,083	30,039	30,036	30,031
4, 343	32,936	32,968	32,905	32,919	30,039	30,070	30,116	30,038	30,019	30,013	32,921	32,932	30,008
639	(*)	30,033	30,070	30,137	30,134	30,115	30,145	30,053	30,056	32,951	30,940	30,032	30,064
28	32,985	30,043	30,068	32,176	30,159	30,130	30,145	30,097	30,082	32,859	32,951	30,035	30,065
38	32,986	30,012	32,986	30,028	30,119	30,148	30,195	30,108	30,081	32,968	32,958	30,035	30,065
60	32,986	30,005	32,959	30,015	30,149	30,158	30,147	30,083	30,083	30,001	32,937	32,904	30,064
8, 550 B	32,985	30,041	30,041	30,096	30,204	30,181	30,231	30,126	30,083	32,955	32,968	30,034	30,069
237	30,092	32,949	30,081	30,047	30,135	30,209	30,274	30,214	30,077	32,951	32,964	30,034	30,070
63	30,060	30,068	30,068	30,055	30,199	30,191	30,318	30,100	30,057	32,951	32,964	30,034	30,070
84	30,053	30,008	32,833	32,910	32,841	32,668	30,318	30,118	30,096	32,923	32,960	30,034	30,088
1, 900	32,988	30,029	30,019	30,101	30,208	30,170	30,195	30,097	32,976	32,958	32,968	30,035	30,079
Springfield, Ill.	30,010	32,976	30,046	30,029	30,041	30,196	30,239	30,097	32,976	32,958	32,968	30,035	30,079
Stockton, Fort, Tex.	30,061	30,061	30,064	30,097	30,151	30,144	30,239	30,097	30,098	32,967	32,961	30,035	30,067
Talcoah Island, Wash. T.	32,954	32,963	30,025	30,017	30,197	30,258	30,274	30,118	30,098	32,960	32,946	30,035	30,048
Thomas, Camp, Ariz.	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
2, 710 B	32,954	30,027	30,060	32,926	30,143	32,159	30,204	30,067	32,917	32,918	30,019	32,908	30,034
651	32,997	32,996	30,060	30,096	30,099	30,098	30,138	30,049	30,035	32,904	32,881	32,791	30,034
13	30,077	30,034	32,640	32,845	32,973	32,037	32,474	32,775	32,609	32,776	32,770	32,779	30,037
244	30,077	30,034	30,032	30,067	30,203	30,183	30,284	30,106	30,038	32,989	30,010	32,999	30,037
108	30,027	30,070	30,091	30,184	30,208	30,159	30,181	30,110	30,064	32,923	32,978	30,031	30,090
8, 899	32,804	32,859	32,951	32,925	30,137	30,199	30,214	30,068	32,940	32,955	32,964	30,035	30,091
West Las Animas, Colo.	30,029	30,029	30,024	30,117	30,230	30,177	30,262	30,121	30,061	32,923	32,964	30,035	30,091
Wilmington, N. C.	30,059	30,016	30,068	30,117	30,068	30,177	30,262	30,121	30,061	32,923	32,964	30,035	30,091
Yankton, Dak.	32,803	32,828	32,798	32,874	30,068	30,196	30,278	30,181	30,038	32,937	32,951	30,035	30,091
Yuma, Ariz.	32,802	32,828	32,798	32,874	30,068	30,196	30,278	30,181	30,038	32,937	32,951	30,035	30,091

10 Observations recommenced July 20, 1883.

11 For 26 days only.

12 Observations began October 1, 1883.

13 For 19 days only.

14 No record.

15 Observations recommenced October 1, 1883.

16 For twenty-seven days only.

17 Observations recommenced October 10, 1883.

18 For thirty days only.

19 For twenty-nine days only.

20 For twenty-eight days only.

21 For twenty-five days only.

22 Observations discontinued April 1, 1884.

## APPENDIX 24.

Monthly and annual mean barometer (corrected for temperature and instrumental error only) at stations of the Signal Service, United States Army, for the year ending June 30, 1884, deduced from observations taken at 7 a. m., 3 and 11 p. m., Washington time.

[The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. observations by three; the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	Elevation of barometer above mean sea-level.	1883.						1884.						Annual mean.
		July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Albany, N. Y.	83	29.874	29.933	29.903	29.998	29.938	29.917	29.940	29.905	29.951	29.979	29.956	29.901	29.968
Alexander, Fort, Alaska.	88	29.281	29.377	29.410	29.460	29.319	29.336	29.359	29.347	29.351	29.300	29.258	29.430	29.352
Alpena, Mich.	609	29.088	29.119	29.094	29.067	29.045	29.048	29.059	29.074	29.028	29.020	29.065	29.094	29.017
Apache, Fort, Ariz.	5,050 B	27.179	27.187	27.259	27.122	27.096	27.103	27.217	27.192	27.080	27.144	27.129	27.084	27.154
Ashtabula, Fort, Mont.	2,720 B	29.946	29.911	29.912	29.953	29.934	29.994	29.916	29.927	29.880	29.890	29.848	29.877	29.924
Atlanta, Ga.	1,129	29.971	29.918	29.948	29.930	29.943	29.996	29.913	29.927	29.922	29.880	29.833	29.865	29.880
Atlantic City, N. J.	13	29.971	29.918	29.948	29.930	29.943	29.996	29.913	29.927	29.922	29.880	29.833	29.865	29.880
Augusta, Ga.	183	29.967	29.888	29.881	29.938	29.938	29.907	29.906	29.949	29.900	29.791	29.929	29.873	29.921
Baltimore, Md.	45	29.981	29.909	29.938	29.938	29.938	29.910	29.934	29.938	29.910	29.869	29.929	29.941	29.935
Barnegat City, N. J.	22	29.985	29.916	29.949	29.938	29.934	29.907	29.913	29.933	29.905	29.827	29.934	29.961	29.930
Behring's Island, Behring Sea.	20	29.837	29.816	29.775	29.603	29.517	29.512	29.565	29.540	29.579	29.744	29.811	29.938	29.711
Bennett, Fort, Dak.	1,610 B	29.394	29.424	29.457	29.429	29.401	29.491	29.503	29.496	29.385	29.404	29.384	29.339	29.432
Benton, Fort, Mont.	2,681 B	27.235	27.261	27.325	27.209	27.175	27.250	27.308	27.268	27.189	27.196	27.194	27.138	27.228
Bismarck, Dak.	1,694	29.156	29.098	29.063	29.132	29.096	29.049	29.077	29.040	29.048	29.175	29.114	29.130	29.108
Block Island, R. I.	27	29.942	29.998	29.923	29.938	29.911	29.906	29.973	29.937	29.908	29.868	29.816	29.801	29.898
Boston City, Idaho.	2,760 B	27.187	27.161	27.183	27.194	27.268	27.335	27.375	27.186	27.092	27.074	27.127	27.108	27.187
Boston, Mass.	25	29.812	29.882	29.892	29.893	29.867	29.817	29.905	29.890	29.848	29.697	29.797	29.780	29.800
Brownsville, Tex.	59	29.980	29.944	29.942	29.911	29.918	29.908	29.913	29.907	29.900	29.849	29.882	29.875	29.959
Buffalo, N. Y.	680	29.238	29.311	29.328	29.333	29.288	29.279	29.316	29.287	29.267	29.154	29.175	29.380	29.278
Buford, Fort, Dak.	1,980 B	27.946	27.997	27.959	27.947	27.906	27.968	28.041	28.025	27.926	27.967	27.927	27.875	27.968
Calto, Ill.	577	29.686	29.696	29.697	29.707	29.704	27.968	28.041	28.025	27.926	27.967	27.927	27.875	27.968
Candy, Fort, Wash.	179	29.021	29.021	29.036	29.038	29.001	29.033	29.080	29.028	29.031	29.744	29.649	29.706	29.606
Cape Henry, Va.	16	29.988	29.999	29.993	29.915	29.129	29.031	29.144	29.081	29.029	29.744	29.649	29.706	29.606
Cape May, N. J.	37	29.306	29.339	29.367	29.333	29.308	29.065	29.110	29.062	29.000	29.884	29.965	29.047	29.005
Cape Mendocino, Cal.	637	29.044	29.019	29.001	29.043	29.036	29.034	29.079	29.036	29.011	29.279	29.812	29.805	29.831
Cedar Key, Fla.	23	29.911	29.973	29.949	29.943	29.943	29.103	29.119	29.128	29.068	29.867	29.937	29.985	29.973
Charleston, S. C.	59	29.317	29.354	29.317	29.354	29.356	29.386	29.403	29.384	29.315	29.413	29.487	29.543	29.485
Chattanooga, Tenn.	783	29.299	29.282	29.282	29.284	29.286	29.286	29.286	29.284	29.284	29.284	29.284	29.284	29.284
Chaynes, Wyo.	5,153	24.137	24.174	24.163	24.068	29.976	29.996	29.996	29.996	29.996	29.996	29.996	29.996	29.996



# REPORT OF THE CHIEF SIGNAL OFFICER.

Stations.	Elevation of barom. over station above mean sea-level.	1883.						1884.						Annual mean.
		July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Marquette, Mich.....	678	Inches. 29.201	Inches. 29.304	Inches. 29.345	Inches. 29.378	Inches. 29.216	Inches. 29.273	Inches. 29.323	Inches. 29.316	Inches. 29.287	Inches. 29.291	Inches. 29.218	Inches. 29.337	Inches. 29.291
Memphis, Tenn.....	831	29.720	29.711	29.712	29.718	29.806	29.806	29.808	29.721	29.674	29.610	29.658	29.667	29.727
Millwaukee, Wis.....	697	29.221	29.315	29.324	29.348	29.269	29.264	29.246	29.244	29.246	29.200	29.174	29.209	29.272
Mobile, Ala.....	35	30.054	30.090	30.099	30.025	30.129	30.129	30.125	30.076	30.019	29.047	29.065	29.049	30.042
Montgomery, Ala.....	219	29.855	29.807	29.812	29.854	29.972	29.943	30.023	29.886	29.824	29.745	29.764	29.761	29.854
Mount Washington, N. H.....	923	29.844	29.006	29.059	29.049	29.076	29.076	29.170	29.063	29.007	29.005	29.060	29.065	29.028
Moorehead, Minn.....	279	29.852	29.838	29.859	29.813	29.692	29.692	29.643	29.479	29.443	29.491	29.400	29.472	29.655
Mountain View, N. H.....	649	29.499	29.492	29.475	29.502	29.603	29.593	29.643	29.479	29.439	29.380	29.400	29.420	29.489
Nashville, Tenn.....	107	29.846	29.912	29.958	30.047	30.006	30.068	30.080	29.854	29.893	29.716	29.810	29.977	29.925
New Haven, Conn.....	47	29.937	29.978	29.994	30.047	30.094	30.056	30.186	30.036	29.977	29.915	29.985	30.011	29.925
New London, Conn.....	52	29.823	29.878	29.919	29.967	30.100	30.053	30.054	29.911	29.846	29.876	29.945	30.058	29.885
New Orleans, La.....	164	30.035	29.967	29.998	30.047	30.094	30.056	30.186	30.036	29.977	29.915	29.985	30.011	29.925
New York City.....	80	30.002	29.998	30.010	30.100	30.160	30.115	30.134	30.043	29.911	29.846	29.945	30.049	30.085
North Platte, Nebr.....	2	37.091	37.158	37.170	27.086	27.067	27.111	27.161	27.043	26.961	27.006	27.056	27.075	27.062
Olympia, Wash T.....	36	30.047	30.059	29.977	29.970	29.952	30.047	30.085	30.012	29.896	29.868	29.869	29.916	29.906
Owango, N. Y.....	1, 118	29.829	29.909	29.924	29.910	29.888	29.913	29.920	29.891	29.805	29.779	29.801	29.853	29.875
Owango, N. Y.....	533	29.624	29.702	29.741	29.803	29.726	29.721	29.757	29.704	29.688	29.672	29.694	29.760	29.677
Pasadena, Tex.....	30	30.066	30.020	29.924	30.034	30.150	30.138	30.203	30.090	30.086	29.065	29.075	29.067	29.052
Philadelphia, Pa.....	117	29.894	29.835	29.872	30.001	30.045	30.009	30.220	30.071	29.907	29.753	29.841	29.908	29.946
Pike's Peak, Colo.....	14, 766	18.121	18.158	18.063	17.732	17.727	17.652	17.589	17.470	17.517	17.620	17.818	18.013	17.788
Pittsburg, Pa.....	683	29.224	29.296	29.273	29.311	29.323	29.318	29.241	29.189	29.187	29.085	29.132	29.241	29.238
Port Huron, Mich.....	45	29.259	29.340	29.359	29.368	29.326	29.318	29.244	29.233	29.201	29.224	29.213	29.260	29.210
Portland, Me.....	67	29.850	29.031	29.092	30.097	30.068	30.078	30.063	30.067	29.019	29.744	29.864	29.999	29.948
Portland, Oreg.....	5, 889 B	29.976	30.005	29.981	29.966	30.041	19.045	30.007	30.067	29.854	29.861	29.929	29.877	29.900
Prescott, Ariz.....	29	29.811	29.839	29.780	29.714	24.767	24.774	24.754	24.681	24.631	24.647	24.711	24.785	24.737
Provincetown, Mass.....	29	29.970	29.979	29.989	30.131	30.060	30.014	30.049	30.024	29.948	( <sup>c</sup> )	29.592	29.574	29.544
Red Bluff, Cal.....	332	29.920	29.970	29.956	29.646	29.782	29.801	29.808	29.685	29.595	29.717	29.735	29.437	29.445
Rio Grande City, Tex.....	280 B	29.525	( <sup>c</sup> )	( <sup>c</sup> )	29.773	29.907	29.943	29.803	29.644	29.769	29.708	29.735	29.437	29.445
Rochester, N. Y.....	621	29.489	29.458	29.474	29.474	29.907	29.874	29.840	29.349	29.340	29.407	29.461	29.430	29.433
Roseburg, Oreg.....	611	29.820	29.854	29.819	29.819	29.625	29.599	29.677	29.468	29.395	29.407	29.461	29.430	29.433
Sacramento, Cal.....	64	29.435	29.492	29.444	29.478	30.038	30.005	30.008	29.971	29.896	29.812	29.866	29.890	29.893
Saint Louis, Mo.....	571	29.806	29.806	29.843	29.871	29.025	29.005	29.008	29.490	29.401	29.523	29.544	29.576	29.578
Saint Michael's, Fort, Alaska.....	80	29.806	29.806	29.843	29.871	29.025	29.005	29.008	29.490	29.401	29.523	29.544	29.576	29.578
Saint Paul, Minn.....	901	29.031	29.167	29.204	29.313	29.105	29.176	29.201	29.157	29.137	29.098	29.143	29.143	29.143

Saint Vincent, Minn.....	804	29, 055	29, 170	29, 083	29, 214	29, 278	29, 249	29, 140	29, 185	29, 100	29, 079	29, 187
Salt Lake City, Utah.....	4, 848	29, 687	29, 687	29, 714	29, 742	29, 776	29, 776	29, 506	29, 526	29, 601	29, 586	29, 640
Sandwich, Ohio.....	67	29, 888	29, 909	29, 949	29, 949	29, 949	29, 949	29, 949	29, 942	29, 919	29, 882	29, 933
Sandy Hook, N. J.....	639	29, 893	29, 437	29, 414	29, 385	29, 436	29, 436	29, 336	29, 251	29, 270	29, 833	29, 883
Sanford, Fla.....	28	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905
San Francisco, Cal.....	36	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905	29, 905
Savannah, Ga.....	60	29, 916	29, 935	29, 945	29, 945	29, 945	29, 945	29, 945	29, 945	29, 945	29, 945	29, 945
Shaw, Fort, Mont.....	87	29, 951	29, 951	29, 951	29, 951	29, 951	29, 951	29, 951	29, 951	29, 951	29, 951	29, 951
Shreveport, La.....	3, 550 B	29, 416	29, 419	29, 419	29, 419	29, 419	29, 419	29, 419	29, 419	29, 419	29, 419	29, 419
Sitka, Alaska.....	227	29, 832	29, 808	29, 815	29, 815	29, 815	29, 815	29, 815	29, 815	29, 815	29, 815	29, 815
Smithville, N. C.....	63	29, 000	29, 943	29, 772	29, 772	29, 772	29, 772	29, 772	29, 772	29, 772	29, 772	29, 772
Spokane Falls, Wash. T.....	34	29, 028	29, 969	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979
Springfield, Ill.....	1, 906	29, 006	29, 976	29, 976	29, 976	29, 976	29, 976	29, 976	29, 976	29, 976	29, 976	29, 976
Stockton, Port, Tex.....	644	29, 350	29, 401	29, 431	29, 431	29, 431	29, 431	29, 431	29, 431	29, 431	29, 431	29, 431
Tacooah Island, Wash T.....	3, 010 B	27, 014	29, 043	29, 043	29, 043	29, 043	29, 043	29, 043	29, 043	29, 043	29, 043	29, 043
Thomas, Camp, Ariz.....	86	( <sup>e</sup> )	29, 357	29, 357	29, 357	29, 357	29, 357	29, 357	29, 357	29, 357	29, 357	29, 357
Toledo, Ohio.....	2, 710 B	29, 254	29, 370	29, 370	29, 370	29, 370	29, 370	29, 370	29, 370	29, 370	29, 370	29, 370
Unalaksha, Alaska.....	651	29, 975	29, 975	29, 975	29, 975	29, 975	29, 975	29, 975	29, 975	29, 975	29, 975	29, 975
Vicksburg, Miss.....	13	29, 837	29, 794	29, 823	29, 823	29, 823	29, 823	29, 823	29, 823	29, 823	29, 823	29, 823
Washington City.....	244	29, 837	29, 837	29, 837	29, 837	29, 837	29, 837	29, 837	29, 837	29, 837	29, 837	29, 837
West Las Animas, Colo.....	106	29, 960	29, 960	29, 960	29, 960	29, 960	29, 960	29, 960	29, 960	29, 960	29, 960	29, 960
Wilmington, N. C.....	3, 890	29, 054	29, 119	29, 119	29, 119	29, 119	29, 119	29, 119	29, 119	29, 119	29, 119	29, 119
Yankton, Dak.....	53	29, 009	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979	29, 979
Yuma, Ariz.....	1, 228	29, 688	29, 746	29, 746	29, 746	29, 746	29, 746	29, 746	29, 746	29, 746	29, 746	29, 746
	1, 141	29, 663	29, 759	29, 759	29, 759	29, 759	29, 759	29, 759	29, 759	29, 759	29, 759	29, 759

<sup>1</sup> 30 days only.  
<sup>2</sup> 29 days only.  
<sup>3</sup> 28 days only.  
<sup>4</sup> 25 days only.

<sup>5</sup> Observations discontinued April 1, 1881.

<sup>6</sup> No record.  
<sup>7</sup> Observations recommenced October 1, 1883.  
<sup>8</sup> 27 days only.

<sup>9</sup> Observations recommenced October 10, 1883.

<sup>10</sup> Observations recommenced July 20, 1883.  
<sup>11</sup> 26 days only.  
<sup>12</sup> Observations began October 1, 1883.  
<sup>13</sup> 19 days only.



## APPENDIX 25.

Mean normal barometer at stations of the Signal Service, United States Army, for each month of the year, computed from the three telegraphic observations, and from November 1, 1879, to October 31, 1883, inclusive, except at stations opened subsequent to the former date.

(The means in this table have been reduced to the elevation in use on December 31, 1884.)

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Inches.
Albany, N. Y.	Dec. 22, 1873	30.072	30.066	30.047	30.077	30.010	29.840	29.868	29.943	29.980	30.039	30.070	30.031	29.903
Alpena, Mich.	Oct. 10, 1872	29.375	29.370	29.330	29.321	29.337	29.258	29.311	29.374	29.377	29.388	29.386	29.351	29.349
Apache, Fort, Ariz.	Sept. 1, 1877	25.015	25.021	25.011	24.985	24.966	25.007	25.074	25.073	25.000	25.025	25.047	25.066	25.029
Asinabolia, Fort, Mont.	Oct. 6, 1879	27.151	27.137	27.131	27.092	27.135	27.076	27.153	27.160	27.108	27.114	27.227	27.149	27.146
Atlanta, Ga.	Sept. 25, 1878	29.974	29.974	29.951	29.864	29.884	29.876	29.910	29.865	29.917	29.949	29.907	29.944	29.906
Atlantic City, N. J.	Dec. 10, 1873	30.011	30.015	30.017	30.052	30.079	30.014	30.013	30.031	30.051	30.046	30.074	30.111	30.035
Augusta, Ga.	Nov. 2, 1870	30.163	30.135	30.035	29.979	30.071	29.943	29.870	29.860	29.900	30.011	30.034	30.100	29.927
Baltimore, Md.	Jan. 1, 1871	30.135	30.135	30.159	30.001	29.971	29.904	29.922	29.860	29.834	30.101	30.169	30.107	30.045
Barnegat City, N. J.	Dec. 10, 1873	30.135	30.135	30.159	30.001	29.971	29.904	29.922	29.860	29.834	30.101	30.169	30.107	30.045
Bennett, Fort, Dak.	Dec. 22, 1879	29.429	28.470	28.444	28.360	28.317	28.288	28.288	28.341	28.343	28.388	28.473	28.453	28.395
Benton, Fort, Dak.	Oct. 11, 1870	27.103	27.103	27.201	27.139	27.167	27.134	27.155	27.158	27.221	27.198	27.259	27.203	27.198
Blancard, Dak.	Sept. 15, 1874	28.178	28.178	28.197	28.144	28.144	28.061	28.165	28.171	28.169	28.159	28.217	28.217	28.163
Block Island, R. I.	Sept. 1, 1880	30.080	30.080	30.087	30.017	29.988	29.906	29.942	29.987	30.035	30.095	30.138	30.019	30.010
Boise City, Idaho	July 1, 1877	27.259	27.257	27.217	27.125	27.131	27.092	27.160	27.131	27.181	27.212	27.338	27.246	27.196
Boston, Mass.	Nov. 9, 1870	29.982	29.982	29.953	29.879	29.867	29.791	29.821	29.890	29.831	29.942	29.996	29.993	29.897
Brownsville, Tex.	Aug. 25, 1875	30.044	30.043	30.025	29.918	29.877	29.862	29.862	29.914	29.928	30.039	30.052	30.050	29.859
Buffalo, N. Y.	Nov. 1, 1870	29.329	29.325	29.207	29.218	29.232	29.191	29.210	29.263	29.315	29.342	29.343	29.295	29.280
Butford, Fort, Dak.	Oct. 23, 1878	29.782	29.779	29.013	27.062	27.038	27.064	27.072	27.069	29.013	29.045	29.016	29.016	27.985
Cairo, Ill.	June 1, 1871	29.882	29.779	29.671	29.624	29.624	29.607	29.672	29.657	29.605	29.714	29.816	29.782	29.703
Cape Henry, Va.	Dec. 15, 1873	30.131	30.130	30.130	30.063	30.063	29.958	30.058	30.094	30.072	30.048	30.109	30.104	30.066
Cape May, N. J.	May 24, 1871	30.132	30.130	30.130	30.063	30.063	29.958	30.058	30.094	30.072	30.048	30.109	30.104	30.066
Cape Mendocino, Cal.	July 27, 1872	29.638	29.606	29.582	29.581	29.581	29.581	29.581	29.581	29.581	29.581	29.581	29.581	29.581
Cedar Key, Fla.	Nov. 7, 1879	30.139	30.139	30.139	30.139	30.139	30.139	30.139	30.139	30.139	30.139	30.139	30.139	30.139
Charleston, S. C.	Oct. 6, 1871	30.124	30.153	30.056	30.044	30.044	30.028	30.062	30.062	30.015	30.021	30.021	30.021	30.070
Charlotte, N. C.	Jan. 6, 1879	29.263	29.263	29.263	29.170	29.170	29.156	29.156	29.188	29.188	29.268	29.327	29.307	29.041
Chattanooga, Tenn.	Jan. 6, 1879	29.263	29.263	29.263	29.170	29.170	29.156	29.156	29.188	29.188	29.268	29.327	29.307	29.041
Cheyenne, Wyo.	Nov. 1, 1870	29.844	29.844	29.844	29.818	29.818	29.818	29.818	29.818	29.818	29.818	29.818	29.818	29.818
Chicago, Ill.	Nov. 1, 1870	29.844	29.844	29.844	29.818	29.818	29.818	29.818	29.818	29.818	29.818	29.818	29.818	29.818
Chickasaw, Va.	Mar. 16, 1880	30.365	30.371	30.283	30.262	30.271	30.219	30.297	30.319	30.319	30.347	30.362	30.368	30.317
Cincinnati, Ohio	Nov. 1, 1870	30.365	30.371	30.283	30.262	30.271	30.219	30.297	30.319	30.319	30.347	30.362	30.368	30.317
Cleveland, Ohio	Nov. 1, 1870	30.365	30.371	30.283	30.262	30.271	30.219	30.297	30.319	30.319	30.347	30.362	30.368	30.317
Columbus, Ohio	Nov. 1, 1870	30.365	30.371	30.283	30.262	30.271	30.219	30.297	30.319	30.319	30.347	30.362	30.368	30.317
Concho, Fort, Tex.	Oct. 10, 1878	29.267	29.267	29.267	29.267	29.267	29.267	29.267	29.267	29.267	29.267	29.267	29.267	29.267
Croft, Fort, Mont.	Dec. 6, 1878	29.763	29.763	29.763	29.763	29.763	29.763	29.763	29.763	29.763	29.763	29.763	29.763	29.763
Davenport, Iowa	May 24, 1871	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436	29.436



# REPORT OF THE CHIEF SIGNAL OFFICER.

Station.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Inches.
Norfolk, Va.	Jan. 1, 1871	30.150	30.175	30.960	30.966	30.013	30.947	30.964	30.010	30.034	30.093	30.176	30.117	30.054
North Platte, Neb.	Sept. 18, 1874	30.023	30.069	30.055	30.963	30.013	30.947	30.964	30.010	30.034	30.093	30.176	30.117	30.054
Olympia, Wash.	July 1, 1877	30.093	30.069	30.055	30.963	30.013	30.947	30.964	30.010	30.034	30.093	30.176	30.117	30.054
Omaha, Neb.	Nov. 1, 1870	30.918	30.916	30.869	30.951	30.026	30.905	30.935	30.011	30.008	30.992	30.110	30.947	30.015
Owego, N. Y.	Nov. 1, 1870	30.918	30.916	30.869	30.951	30.026	30.905	30.935	30.011	30.008	30.992	30.110	30.947	30.015
Palestine, Tex.	Dec. 3, 1881	30.629	30.609	30.533	30.619	30.673	30.605	30.638	30.596	30.728	30.774	30.790	30.736	30.707
Pensacola, Fla.	Oct. 27, 1879	30.138	30.137	30.056	30.019	30.444	30.497	30.035	30.986	30.008	30.087	30.146	30.137	30.059
Philadelphia, Pa.	Jan. 1, 1871	30.058	30.064	30.850	30.878	30.911	30.839	30.874	30.932	30.953	30.963	30.011	30.956	30.011
Pike's Peak, Colo.	Nov. 1, 1870	30.147	30.151	30.167	30.174	30.202	30.158	30.218	30.244	30.274	30.299	30.350	30.288	30.250
Pittsburgh, Pa.	Nov. 1, 1870	30.304	30.320	30.167	30.174	30.202	30.158	30.218	30.244	30.274	30.299	30.350	30.288	30.250
Port Huron, Mich.	May 1, 1863	30.900	30.936	30.933	30.933	30.924	30.933	30.944	30.939	30.945	30.937	30.937	30.939	30.936
Portland, Me.	July 25, 1874	30.386	30.386	30.386	30.386	30.386	30.386	30.386	30.386	30.386	30.386	30.386	30.386	30.386
Portland, Ore.	Jan. 15, 1871	30.037	30.033	30.836	30.852	30.944	30.947	30.966	30.974	30.967	30.987	30.116	30.965	30.003
Prescott, Ariz.	Nov. 1, 1871	30.041	30.018	30.018	30.018	30.018	30.018	30.018	30.018	30.018	30.018	30.018	30.018	30.018
Provincetown, Mass.	Nov. 15, 1873	30.099	30.099	30.099	30.099	30.099	30.099	30.099	30.099	30.099	30.099	30.099	30.099	30.099
Red Bluff, Cal.	Feb. 15, 1882	30.120	30.149	30.933	30.954	30.907	30.880	30.938	30.969	30.026	30.097	30.033	30.096	30.009
Rio Grande City, Tex.	May 28, 1875	30.808	30.789	30.696	30.640	30.601	30.680	30.715	30.757	30.768	30.817	30.917	30.888	30.768
Rochester, N. Y.	Nov. 1, 1870	30.418	30.425	30.298	30.294	30.283	30.279	30.297	30.258	30.285	30.285	30.448	30.361	30.361
Roseburg, Ore.	July 15, 1877	30.596	30.596	30.596	30.596	30.596	30.596	30.596	30.596	30.596	30.596	30.596	30.596	30.596
Sacramento, Cal.	July 1, 1877	30.100	30.100	30.083	30.085	30.084	30.085	30.085	30.085	30.087	30.087	30.087	30.087	30.087
Saint Louis, Mo.	Nov. 1, 1870	30.523	30.517	30.418	30.406	30.389	30.381	30.432	30.423	30.445	30.467	30.556	30.516	30.451
Saint Paul, Minn.	Nov. 1, 1870	30.167	30.172	30.138	30.090	30.077	30.092	30.109	30.132	30.121	30.123	30.188	30.177	30.146
Salt Lake City, Utah	Sept. 5, 1880	30.230	30.213	30.214	30.154	30.115	30.028	30.074	30.118	30.093	30.093	30.206	30.190	30.146
Salt Lake City, Utah	Mar. 23, 1874	30.675	30.683	30.638	30.559	30.573	30.574	30.659	30.637	30.651	30.644	30.750	30.684	30.644
San Diego, Cal.	Nov. 1, 1871	30.097	30.097	30.004	30.005	30.003	30.004	30.004	30.004	30.004	30.004	30.004	30.004	30.004
Sandusky, Ohio	Aug. 2, 1877	30.418	30.419	30.302	30.302	30.302	30.302	30.302	30.302	30.302	30.302	30.302	30.302	30.302
Sandy Hook, N. J.	Dec. 10, 1873	30.132	30.140	30.928	30.928	30.928	30.928	30.928	30.928	30.928	30.928	30.928	30.928	30.928
San Francisco, Cal.	Mar. 6, 1871	30.102	30.095	30.094	30.097	30.097	30.097	30.097	30.097	30.097	30.097	30.097	30.097	30.097
Savannah, Ga.	Jan. 1, 1880	30.091	30.129	30.968	30.968	30.968	30.968	30.968	30.968	30.968	30.968	30.968	30.968	30.968
Shaw, Fort, Mont.	Apr. 1, 1880	30.323	30.315	30.345	30.345	30.345	30.345	30.345	30.345	30.345	30.345	30.345	30.345	30.345
Shreveport, La.	Sept. 2, 1871	30.893	30.896	30.811	30.743	30.740	30.761	30.808	30.808	30.811	30.811	30.921	30.835	30.811
Still Point, Ind. T.	June 28, 1875	30.850	30.853	30.777	30.699	30.693	30.693	30.708	30.778	30.802	30.802	30.921	30.896	30.896
Smithville, N. C.	Oct. 15, 1875	30.146	30.187	30.999	30.018	30.006	30.006	30.015	30.009	30.031	30.031	30.076	30.047	30.009
Spokane Falls, Wash.	Feb. 6, 1881	30.043	30.049	30.016	30.006	30.007	30.007	30.015	30.015	30.015	30.015	30.128	30.127	30.097
Springfield, Ill.	July 1, 1879	30.486	30.486	30.383	30.383	30.383	30.383	30.383	30.383	30.383	30.383	30.437	30.437	30.437
Stockton, Fort, Tex.	Feb. 28, 1879	30.019	30.019	30.019	30.019	30.019	30.019	30.019	30.019	30.019	30.019	30.019	30.019	30.019
Thomas, Camp, Ariz.	Sept. 22, 1876	30.365	30.365	30.365	30.365	30.365	30.365	30.365	30.365	30.365	30.365	30.365	30.365	30.365
Tulsa, Okla.	Nov. 1, 1870	30.900	30.900	30.900	30.900	30.900	30.900	30.900	30.900	30.900	30.900	30.900	30.900	30.900

Vicksburg, Miss.	Sept. 10, 1871	29,809	29,805	29,812	29,760	29,753	29,764	29,815	29,771	29,803	29,824	29,829	29,908	29,829
Washington City.	Nov. 1, 1870	30,081	30,086	30,812	30,806	30,872	30,893	31,802	32,148	32,973	32,981	32,099	32,040	29,879
West Las Animas, Colo.	Nov. 1, 1871	30,117	30,123	30,985	30,983	30,997	30,947	32,090	32,983	32,997	32,999	32,118	32,049	29,980
Washington, D. C.	Oct. 1, 1871	30,117	30,123	30,985	30,983	30,997	30,947	32,090	32,983	32,997	32,999	32,118	32,049	29,980
Yankton, Dak.	Apr. 1, 1873	32,758	32,771	32,733	32,683	32,631	32,607	32,701	32,703	32,701	32,707	32,701	32,781	32,036
Yuma, Ariz.	Nov. 1, 1873	32,929	32,913	32,630	32,761	32,664	32,616	32,653	32,647	32,664	32,718	32,686	32,911	32,710
														29,771

## APPENDIX 26.

Table showing the range of the barometer at stations of the Signal Service, United States Army, for each month of the year 1883.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Albany, N. Y.	1.131	1.122	1.130	1.142	1.152	1.145	1.145	1.145	1.156	1.149	1.150	1.148
Alexander, Fort, Alaska.	2.117	1.007	1.123	1.135	1.145	1.155	1.165	1.175	1.185	1.195	1.205	1.215
Alpena, Mich.	1.259	1.100	1.123	1.128	1.128	1.128	1.128	1.128	1.128	1.128	1.128	1.128
Apache, Fort, Ariz.	0.710	0.748	0.725	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724
Asimaboline, Fort, Mont.	1.120	0.907	0.775	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774	0.774
Atlanta, Ga.	0.922	0.863	0.788	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784
Atlantic City, N. J.	1.168	1.065	1.149	1.149	1.149	1.149	1.149	1.149	1.149	1.149	1.149	1.149
Augusta, Ga.	1.064	0.989	0.841	0.841	0.841	0.841	0.841	0.841	0.841	0.841	0.841	0.841
Baltimore, Md.	1.042	1.077	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195
Barnegat City, N. J.	1.213	1.100	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143
Behring's Island, Behring Sea.	1.446	1.686	1.168	1.168	1.168	1.168	1.168	1.168	1.168	1.168	1.168	1.168
Bennett, Fort, Dak.	1.170	1.082	1.274	1.274	1.274	1.274	1.274	1.274	1.274	1.274	1.274	1.274
Benton, Fort, Mont.	1.180	0.876	1.085	1.085	1.085	1.085	1.085	1.085	1.085	1.085	1.085	1.085
Bismarck, Dak.	1.229	0.943	1.217	1.217	1.217	1.217	1.217	1.217	1.217	1.217	1.217	1.217
Black Island, R. I.	1.168	1.181	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176
Boise City, Idaho.	0.910	1.154	0.874	0.874	0.874	0.874	0.874	0.874	0.874	0.874	0.874	0.874
Boston, Mass.	1.019	1.307	1.408	1.408	1.408	1.408	1.408	1.408	1.408	1.408	1.408	1.408
Brownsville, Tex.	0.763	0.884	0.785	0.785	0.785	0.785	0.785	0.785	0.785	0.785	0.785	0.785
Buffalo, N. Y.	1.097	1.007	1.138	1.138	1.138	1.138	1.138	1.138	1.138	1.138	1.138	1.138
Buford, Fort, Dak.	1.242	1.044	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
Cairo, Ill.	1.085	1.066	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013	1.013
Canby, Fort, Wash.	1.200	0.916	1.132	1.132	1.132	1.132	1.132	1.132	1.132	1.132	1.132	1.132
Cape Henry, Va.	1.167	1.040	1.029	1.029	1.029	1.029	1.029	1.029	1.029	1.029	1.029	1.029
Cape May, N. J.	0.550	1.048	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.829
Cape Mendocino, Cal.	0.905	0.533	0.810	0.810	0.810	0.810	0.810	0.810	0.810	0.810	0.810	0.810
Cedar Key, Fla.	1.098	0.503	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891
Charleston, S. C.	0.922	0.666	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891
Charlotte, N. C.	0.904	0.719	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891	0.891
Chattanooga, Tenn.	0.707	1.073	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898
Cheyenne, Wyo.	1.170	1.111	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050
Chicago, Ill.	1.153	0.978	1.248	1.248	1.248	1.248	1.248	1.248	1.248	1.248	1.248	1.248
Chincoteague, Va.	1.153	0.934	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985
Cincinnati, Ohio	1.011	0.910	1.009	1.009	1.009	1.009	1.009	1.009	1.009	1.009	1.009	1.009
Cleveland, Ohio	1.049	0.904	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898	0.898
Columbia, S. C.	1.073	1.034	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
Columbus, Ohio	1.041	0.981	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
Cooke, Fort, Tex.	0.978	1.064	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912
Cooke, Fort, Tex.	0.978	1.064	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912	0.912

Custer, Fort, Mont.	1.100	(*)	0.878	0.876	0.900	0.848	0.565	0.848	0.924	1.103	1.219
Dayton, Fort, Tex.	0.828	0.815	0.846	0.816	0.880	0.988	0.562	0.792	1.131	0.991	0.991
Dayton, Wash.	0.976	0.968	0.702	0.516	0.351	0.351	0.302	0.440	0.593	0.616	0.616
Deadwood, Dak.	0.907	0.908	0.702	0.892	0.078	0.360	0.464	0.598	0.909	0.992	1.111
Delaware Breakwater, Del.	1.009	0.998	1.141	0.914	0.510	0.504	0.559	0.769	0.904	0.821	1.111
Denver, Colo.	0.827	0.948	0.867	0.943	0.790	0.540	0.580	0.818	1.154	0.878	1.150
Des Moines, Iowa	1.129	0.948	0.986	0.964	0.534	0.422	0.424	0.735	0.787	0.875	0.984
Detroit, Mich.	1.163	1.125	0.785	0.964	0.534	0.638	0.630	0.704	1.037	1.216	1.110
Dodge City, Kans.	0.956	0.945	1.581	0.989	0.970	0.988	0.508	0.941	1.851	1.024	0.971
Drumhine, Iowa	1.364	1.178	0.894	0.989	0.940	0.671	0.825	0.670	0.940	1.064	1.136
Duluth, Minn.	1.172	1.548	1.109	0.942	0.996	0.739	0.904	0.772	1.278	1.129	1.083
Eastport, Me.	1.091	1.652	1.083	0.946	0.078	0.615	0.621	0.517	1.593	1.590	1.839
Elliot, Fort, Tex.	1.400	0.834	1.177	0.965	0.486	0.439	0.380	0.517	0.819	0.965	1.083
El Paso, Tex.	0.892	0.577	0.975	0.472	0.486	0.338	0.541	1.010	1.896	1.028	0.819
El Paso, Tex.	1.048	0.916	0.720	0.767	0.864	0.538	0.378	0.580	0.638	0.748	0.819
Escanaba, Mich.	1.336	1.881	0.916	0.820	0.783	0.732	0.781	0.918	1.267	1.321	1.158
Fort Smith, Ark.	0.970	0.969	1.017	0.682	0.539	0.519	0.311	0.385	0.863	1.064	1.053
Galveston, Tex.	0.756	0.955	0.953	0.408	0.319	0.816	0.317	0.349	0.508	0.803	0.809
Grand Haven, Mich.	1.090	1.112	0.877	0.709	0.777	0.688	0.317	0.922	1.222	1.086	1.069
Grant, Fort, Ariz.	0.627	0.623	0.639	0.306	0.248	(*)	0.260	0.348	0.418	0.496	0.460
Hastings, N. C.	0.627	0.607	0.911	0.851	0.658	0.557	0.399	0.550	0.752	0.691	0.800
Huron, Dak.	1.011	0.816	0.827	0.743	0.543	0.579	0.424	0.777	0.918	0.925	1.167
Indianapolis, Ind.	1.225	1.535	1.231	1.169	0.836	0.740	0.780	0.665	1.136	1.102	1.872
Indianapolis, Tex.	1.127	0.960	0.762	0.822	0.785	0.616	0.423	0.709	1.095	1.045	0.901
Jacksonville, Fla.	0.771	0.991	1.033	0.458	0.494	0.368	0.307	0.345	0.547	0.845	0.868
Keokuk, Iowa	1.087	0.870	0.901	0.641	0.858	0.868	0.371	0.411	0.374	0.475	0.984
Key West, Fla.	1.192	1.119	0.974	0.860	0.576	0.742	0.503	0.410	0.772	1.140	0.984
Kittyhawk, N. C.	0.835	0.548	0.337	0.407	0.200	0.178	0.268	0.534	0.353	0.228	0.859
Knoxville, Tenn.	0.792	0.666	0.894	0.555	0.585	0.562	0.385	0.530	0.831	0.714	0.869
La Crosse, Wis.	0.981	0.609	0.782	0.530	0.434	0.517	0.315	0.453	0.701	1.062	0.962
Leavenworth, Kans.	1.229	1.234	1.067	0.863	0.637	0.713	0.781	0.844	1.116	1.165	1.079
Leavenworth, Kans.	1.378	1.177	1.162	0.928	0.537	0.610	0.585	0.913	1.149	1.267	1.150
Levinson, Idaho	1.123	0.976	0.784	0.845	0.585	0.427	0.569	1.398	0.946	1.059	1.553
Little Rock, Ark.	1.134	0.942	0.953	0.552	0.585	0.502	0.369	0.323	0.777	1.076	0.986
Los Angeles, Cal.	0.815	0.236	0.627	0.312	0.444	0.256	0.186	0.267	0.532	0.313	0.986
Louisville, Ky.	1.171	0.917	0.860	0.787	0.679	0.579	0.391	0.381	0.868	0.962	0.886
Lynchburg, Va.	0.862	1.006	0.869	0.725	0.807	0.496	0.467	0.688	0.864	0.757	0.904
Madison, Mich.	1.235	0.853	1.010	0.847	0.853	0.741	0.788	0.979	1.226	1.113	1.059
Macon, Fort, N. C.	0.940	0.896	0.923	0.869	0.516	0.646	0.379	0.568	0.867	0.708	0.759
Maginnis, Mich.	0.979	0.894	1.080	0.967	0.494	0.845	0.505	0.812	1.265	1.142	1.048
Marquette, Mich.	1.178	1.456	0.875	0.877	0.985	0.743	0.932	0.857	1.087	1.038	0.851
Memphis, Tenn.	0.965	0.956	1.017	0.566	0.842	0.632	0.343	0.874	1.172	0.866	1.069
Milwaukee, Wis.	1.138	1.136	0.850	0.731	0.981	0.664	0.615	0.872	1.164	1.088	1.069
Mobile, Ala.	0.724	0.846	0.770	0.589	0.823	0.846	0.322	0.417	0.956	0.636	0.543
Montgomery, Ala.	0.879	0.874	0.835	0.569	0.879	0.846	0.322	0.484	0.518	0.645	0.553
Montgomery, Minn.	1.213	0.874	1.022	1.113	0.820	0.846	0.322	0.484	1.210	1.250	1.307
Mont Washington, N. H.	1.084	1.850	0.922	0.728	0.950	0.847	0.574	0.981	1.103	1.610	1.086
Mountain View, N. H.	1.532	0.844	0.837	0.738	0.850	0.847	0.574	0.981	1.103	1.610	1.086
Nashville, Tenn.	0.894	0.893	0.960	0.763	0.541	0.544	0.329	0.410	0.714	0.870	0.721

\* Observations recommended July 21, 1888.  
 \* Record incomplete.

\* Station closed.  
 \* Station temporarily closed.

\* Sixteen days only.  
 \* Station opened September 1, 1883.

Table showing the range of the barometer at stations of the Signal Service, United States Army, for each month of the year 1883—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New Haven, Conn.	1.040	1.149	1.230	1.314	1.387	1.470	1.485	1.475	1.467	1.397	1.321	1.277
New London, Conn.	1.133	1.179	1.435	1.541	1.605	1.695	1.695	1.695	1.695	1.604	1.504	1.476
New Orleans, La.	1.003	1.071	1.012	1.053	1.083	1.095	1.095	1.095	1.095	1.094	1.075	1.069
New York City.	1.049	1.101	1.236	1.337	1.380	1.433	1.433	1.433	1.433	1.355	1.265	1.279
Norfolk, Va.	1.173	1.181	1.120	1.015	1.043	1.049	1.049	1.049	1.049	1.022	1.010	1.022
North Platte, Nebr.	1.201	1.233	1.101	1.071	1.073	1.056	1.056	1.056	1.056	1.048	1.033	1.135
Olympia, Wash.	1.233	1.233	1.092	1.092	1.073	1.056	1.056	1.056	1.056	1.048	1.033	1.135
Omaha, Nebr.	1.170	1.139	1.196	1.210	1.114	1.057	1.057	1.057	1.057	1.048	1.033	1.135
Oglala (Point Barrow), Alaska.	1.533	1.891	1.841	1.197	1.451	1.665	1.724	1.665	1.665	1.665	1.192	1.176
Owego, N. Y.	1.068	1.156	1.231	1.279	1.321	1.355	1.355	1.355	1.355	1.401	1.491	1.337
Palestine, Tex.	1.068	1.108	1.065	1.068	1.068	1.068	1.068	1.068	1.068	1.068	1.068	1.068
Pennsboro, Fla.	1.074	1.061	1.031	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034
Philadelphia, Pa.	1.074	1.061	1.031	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034
Pike's Peak, Colo.	1.031	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034
Pittsburg, Pa.	1.068	1.071	1.011	1.043	1.043	1.043	1.043	1.043	1.043	1.043	1.043	1.043
Poplar River, Mont.	1.262	1.013	1.166	1.099	1.069	1.069	1.069	1.069	1.069	1.069	1.069	1.069
Portland, Me.	1.111	1.043	1.163	1.099	1.069	1.069	1.069	1.069	1.069	1.069	1.069	1.069
Portland, Ore.	1.089	1.124	1.053	1.031	1.031	1.120	1.031	1.031	1.031	1.031	1.031	1.031
Prescott, Ariz.	1.194	1.304	1.015	1.015	1.015	1.015	1.015	1.015	1.015	1.015	1.015	1.015
Provincetown, Mass.	1.015	1.043	1.043	1.043	1.043	1.043	1.043	1.043	1.043	1.043	1.043	1.043
Red Bluff, Cal.	1.077	1.087	1.083	1.083	1.083	1.083	1.083	1.083	1.083	1.083	1.083	1.083
Red Grande City, Tex.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Roanoke, N. Y.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Roanoke, Ore.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Sacramento, Cal.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Saint Louis, Mo.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Saint Michael's, Fort Alaska.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Saint Paul, Minn.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Saint Vincent, Minn.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Salt Lake City, Utah	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
San Diego, Cal.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Sandusky, Ohio	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Sandy Hook, N. J.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Savannah, Ga.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Shaw, Fort, Mont.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231
Still Point, Ind. T.	1.068	1.113	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231	1.231

Sitka, Alaska.....	1.457	0.983	1.869	1.107	0.942	0.814	0.547	1.271	1.437	1.710	1.584
Smithville, N. C.....	1.152	0.883	0.873	0.821	0.804	0.836	0.373	1.081	0.643	0.687	0.713
Spokane Falls, Wash.....	0.996	0.885	0.792	0.847	0.854	0.867	0.489	0.710	0.905	1.052	1.853
Springfield, Ill.....	1.109	1.064	0.920	0.801	0.710	0.649	0.437	0.699	1.067	1.124	0.915
San Antonio, Tex.....	0.666	0.761	0.979	0.596	0.441	0.396	0.331	0.502	0.703	0.773	0.789
Tacoma Island, Wash.....									91.020	0.979	1.287
Thomas, Camp, Ariz.....	0.789	0.516	0.725	0.867	0.319	( <sup>c</sup> )	( <sup>c</sup> )	( <sup>c</sup> )	0.452	0.543	0.694
Toledo, Ohio.....	1.006	1.002	0.684	0.743	0.831	0.861	0.422	0.846	1.228	1.117	0.903
Unalakshik, Alaska.....	2.203	1.890	1.891	1.096	1.210	1.076	1.051	1.559	1.031	2.044	1.821
Vicksburg, Miss.....	0.833	0.870	1.004	0.503	0.400	0.356	0.292	0.319	0.581	0.849	0.791
Washington City.....	1.026	1.176	0.830	0.994	0.743	0.517	0.564	0.848	1.123	0.878	1.031
West Las Animas, Colo.....	0.909	0.962	1.061	1.025	0.583	0.500	0.465	0.774	0.840	0.903	1.023
Wilmington, N. C.....	1.136	0.672	0.843	0.967	0.479	0.532	0.389	0.865	0.067	0.701	0.725
Yankton, Dak.....	1.114	1.235	1.208	1.156	0.567	0.718	0.788	0.699	1.057	1.096	1.263
Yuma, Ariz.....	0.743	0.896	0.815	0.451	0.451	0.340	0.326	0.377	0.644	0.478	( <sup>c</sup> )

\* Station closed.

\* Record incomplete.

\* Station temporarily closed.

\* Observations recommenced October 10, 1883.

\* Observations recommenced July 20, 1883.

\* Barometric observations commenced March 24, 1883.

\* No record.

\* Observations began October 1, 1883.



## APPENDIX 27.

*Annual and mean annual temperatures (in degrees Fahrenheit) at stations of the Signal Service, United States Army.*

[Computed from the three telegraphic observations taken at the same moment of Washington time.]

Stations.	Established.	Mean annual											
		Years.											
		1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Albany, N. Y.	Dec. 22, 1873	°											°
Alpena, Mich.	Sept. 10, 1872	46.8	43.6	47.0	43.1	46.4	48.7	46.4	51.0	51.4	51.0	51.0	48.2
Apache, Fort, Ariz.	Oct. 9, 1877	38.7	41.2			40.9	43.3	45.0	41.8	42.1	42.1	42.1	38.7
Asimabine, Fort, Mont.	Oct. 6, 1879								53.4	50.8	52.4	52.4	52.2
Atlanta, Ga.	Sept. 25, 1878								61.5	62.0	61.5	61.5	59.2
Atlantic City, N. J.	Dec. 10, 1873	51.6	49.2	51.1	53.0	51.5	52.5	53.0	51.5	52.7	51.8	51.8	51.8
Augusta, Ga.	Nov. 2, 1870	61.8	63.8	63.4	64.3	65.2	64.3	65.2	65.2	65.7	65.3	65.8	64.4
Baltimore, Md.	Jan. 1, 1871	55.6	53.1	54.9	54.3	55.9	54.3	55.9	55.6	54.4	57.1	55.7	55.1
Barnegat City, N. J.	Dec. 10, 1873	51.0	48.8	51.0	52.1	52.4	52.1	52.4	50.7	52.4	51.6	51.6	51.4
Bennett, Fort, Dak.	Dec. 22, 1879												43.9
Benton, Fort, Mont.	Oct. 11, 1879	42.5	42.1	43.8	42.1	42.8	42.4	44.8	43.6	44.8	43.6	43.0	42.8
Bismarck, Dak.	Sept. 15, 1874				35.0	36.8	42.4	44.8	39.5	40.1	41.1	41.1	39.5
Block Island, R. I.	Sept. 1, 1880									50.3	50.0	48.6	48.6
Boston, Mass.	Nov. 1, 1870	48.5	46.2	48.7	46.2	47.8	48.3	49.2	47.8	48.9	48.5	48.1	47.6
Brownsville, Tex.	Aug. 25, 1875								72.7	72.6	72.5	73.8	73.0
Buffalo, N. Y.	Nov. 1, 1870	47.4	46.0	46.2	42.7	45.8	47.8	48.8	46.4	47.5	47.3	47.0	44.9
Buford, Fort, Dak.	Oct. 23, 1878								39.0	38.6	39.4	41.0	38.4
Calo, Ill.	June 1, 1871	54.2	54.8	54.4	55.7	57.1	58.5	60.1	59.6	59.0	59.6	59.2	57.4
Cape Henry, Va.	Dec. 15, 1873								58.4	58.3	58.8	58.9	58.1
Cape May, N. J.	May 24, 1871	51.1	52.2	52.3	50.2	53.6	54.8	56.0	54.2	55.6	54.7	55.2	53.6
Cape Mendocino, Cal.	July 27, 1882												53.6
Cedar Keys, Fla.	Nov. 7, 1879												53.6
Charleston, S. C.	Jan. 5, 1871	64.4	64.6	65.7	64.8	65.5	66.1	66.5	66.7	70.5	70.5	71.1	71.2
Charlotte, N. C.	Oct. 8, 1878												66.6
Charlottesville, Tenn.	Jan. 8, 1879												60.6
Cheynne, Wyo.	Nov. 1, 1870	43.1	44.8	45.5	42.5	44.8	44.3	44.2	46.4	46.3	46.4	46.4	44.8
Chicago, Ill.	Nov. 1, 1870	45.6	47.2	50.4	45.4	49.0	50.3	51.4	49.9	49.8	49.4	49.6	48.3
Chincoteague, Va.	Mar. 15, 1880												54.6
Cincinnati, Ohio	Nov. 1, 1870	54.4	53.0	57.0	53.0	55.3	56.2	57.0	56.3	56.8	57.7	56.9	54.6
Cleveland, Ohio	Nov. 1, 1870	48.0	48.6	50.5	45.9	48.0	50.0	50.5	49.1	50.6	49.8	49.8	48.0
Coleman City, Tex.	July 1, 1877												52.7
Columbus, Ohio	Oct. 10, 1878												52.7
Custer, Fort, Mont.	Dec. 5, 1878												51.7
Davenport, Iowa	May 24, 1871	48.7	49.0	49.6	48.4	48.8	50.8	52.8	50.0	51.0	50.4	51.7	48.8

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David, Fort, Tex.....	Dec. 24, 1877	47.6	48.1	48.8	49.6	49.5	48.8	49.5	50.8	52.0	53.9	53.9	4
Dayton, Ohio.....	July 1, 1870								47.8	49.3	48.6	48.1	4
Dayton, Ohio.....	Jan. 25, 1877								40.8	41.4	42.9	43.1	8
Delaware Breakwater, Del.....	Dec. 28, 1880									54.4	54.0	53.8	8
Denver, Colo.....	Nov. 19, 1871	47.6	48.1	48.8	49.6	49.5	48.8	49.5	50.8	52.0	53.9	53.9	12
Des Moines, Iowa.....	Nov. 1, 1878								47.4	49.3	49.7	48.1	12
Detroit, Mich.....	Nov. 1, 1870	45.9	46.3	48.8	44.1	47.3	48.0	49.5	49.8	51.2	51.2	51.0	12
Dodge City, Kans.....	Sept. 15, 1874								49.6	51.3	53.6	51.0	12
Dunkirk, N. Y.....	Nov. 10, 1873								52.0	53.0	48.6	49.0	10
Duluth, Minn.....	July 1, 1870	38.8	39.8	48.9	44.8	47.6	48.6	50.6	48.6	48.6	49.0	48.6	12
Eastport, Me.....	Nov. 1, 1873								43.5	45.8	40.4	41.2	12
Elliot, Fort, Tex.....	Nov. 29, 1879								42.6	43.0	42.1	41.5	10
El Paso, Tex.....	Nov. 8, 1877								54.4	54.9	54.8	54.8	4
Erie, Pa.....	May 25, 1873								56.8	53.0	51.6	52.6	5
Escanaba, Mich.....	May 24, 1871	39.8	39.3	40.4	45.4	49.0	50.8	51.8	49.7	50.4	50.9	47.5	10
Fort Smith, Ark.....	June 1, 1882								43.5	44.6	41.8	41.1	13
Galveston, Tex.....	Apr. 19, 1871	69.4	69.3	70.5	69.8	70.1	68.0	70.0	70.8	70.1	48.1	42.8	13
Grand Haven, Mich.....	May 24, 1871	44.4	45.2	47.5	43.8	46.9	48.0	50.1	47.8	48.3	48.1	48.2	13
Grant, Fort, Ariz.....	Nov. 1, 1875								59.1	59.8	58.6	59.0	5
Hatteras, N. C.....	Dec. 1, 1880								61.9	61.9	61.7	61.2	5
Helena, Mont.....	Oct. 15, 1879								43.8	43.8	43.8	42.7	3
Huron, Dak.....	July 1, 1881								55.0	53.8	46.7	45.3	2
Indianapolis, Ind.....	Feb. 10, 1871	51.4	51.9	54.6	50.2	52.9	54.8	55.0	53.8	54.7	53.8	51.8	13
Indianapolis, Ind.....	Feb. 1, 1872								70.7	71.1	70.8	70.8	11
Jacksonville, Fla.....	Sept. 11, 1871	67.1	68.2	69.4	69.8	69.4	69.4	69.4	69.8	70.2	70.4	70.6	13
Keokuk, Iowa.....	July 16, 1871	51.4	50.5	52.6	49.5	51.0	52.9	55.0	52.9	52.6	49.6	48.6	12
Key West, Fla.....	Nov. 1, 1870	77.2	77.0	77.8	78.1	77.0	77.1	77.1	78.7	78.1	78.2	78.4	13
Kittyhawk, N. C.....	Jan. 15, 1875								59.3	59.3	59.3	59.3	8
Knoxville, Tenn.....	Jan. 1, 1871	55.1	54.5	57.8	55.5	55.7	56.8	57.6	58.3	58.7	58.3	57.9	13
La Crosse, Wis.....	Oct. 15, 1872								48.5	48.0	48.7	48.8	11
Leavenworth, Kans.....	May 21, 1871	53.0	51.7	54.2	51.0	53.2	53.8	55.4	54.1	54.1	54.7	51.7	13
Little Rock, Ark.....	July 1, 1879								61.9	63.0	62.1	62.1	4
Los Angeles, Cal.....	July 1, 1877	54.8	55.7	57.8	54.5	56.2	57.0	60.7	58.4	61.1	60.9	61.6	6
Louisville, Ky.....	Sept. 11, 1871	54.5	55.0	56.6	55.8	57.1	57.5	58.7	57.2	58.2	57.9	58.4	12
Lynchburg, Va.....	May 24, 1871								58.4	58.4	57.5	57.5	12
Mackinaw City, Mich.....	Aug. 20, 1883								58.4	58.4	57.5	57.5	12
Macon, Fort, N. C.....	May 23, 1878								61.9	63.0	62.1	62.1	4
Marquette, Mich.....	July 14, 1882								62.4	62.4	62.4	62.4	3
Marquette, Mich.....	May 1, 1871	39.2	39.2	41.2	37.0	40.8	44.4	46.5	42.5	41.0	42.3	38.1	1
Memphis, Tenn.....	Feb. 28, 1871	59.8	59.6	62.4	59.4	60.1	60.9	61.9	61.9	62.5	62.5	61.1	12
Millwaukee, Wis.....	Nov. 1, 1870	49.7	49.8	45.0	40.8	43.9	45.8	48.5	46.2	46.7	46.3	44.7	12
Mobile, Ala.....	Nov. 7, 1870	65.4	65.4	68.0	68.7	68.0	68.0	67.3	67.0	68.0	68.2	68.9	11
Montgomery, Ala.....	Nov. 9, 1870								65.8	65.8	65.8	65.8	11
Mount Pleasant, Minn.....	Jan. 1, 1881								28.0	28.0	28.0	28.0	3
Mount Washington, N. H.....	Dec. 1, 1870	24.9	25.4	25.8	23.5	25.9	27.8	28.0	28.0	28.0	28.0	28.0	13
Nashville, Tenn.....	Nov. 1, 1870	57.7	59.1	61.5	58.4	58.9	59.5	60.0	60.0	60.8	60.8	59.1	12
New Haven, Conn.....	Dec. 10, 1872								52.9	50.7	51.6	50.0	11
New Orleans, La.....	Jan. 10, 1871	47.8	47.4	49.1	48.2	50.7	52.4	53.9	50.7	49.8	48.7	47.5	11
New Orleans, La.....	Nov. 1, 1870	67.4	68.0	68.9	68.8	68.4	68.3	68.9	68.9	68.9	68.9	68.9	13

**Record incomplete.**

Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	Established.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	Mean annual.	
														Year.	Fahr.
New York City	Nov. 1, 1870	50.6	50.2	51.4	48.6	50.5	52.6	53.9	51.8	52.2	53.2	51.5	50.6	13	51.3
Norfolk, Va.	Jan. 1, 1871	58.0	58.1	58.7	57.6	59.0	58.9	59.8	59.3	60.5	59.9	59.8	59.9	13	59.3
North Platte, Nebr.	Sept. 18, 1874				46.8	47.5	48.2	48.7	48.1	47.1	47.9	48.1	48.9	9	47.8
Olympia, Wash.	July 1, 1877								48.0	47.7	48.7	48.9	48.0	6	48.2
Omaha, Nebr.	Nov. 1, 1870	48.1	48.6	50.0	46.8	48.6	50.9	52.5	51.5	50.8	49.7	51.4	47.8	13	48.7
Owego, N. Y.	Nov. 1, 1870	46.1	46.3	46.9	44.2	47.2	49.0	51.2	48.3	46.1	48.2	47.9	45.8	13	47.5
Palestine, Tex.	Dec. 2, 1881												65.7	1	65.7
Pensacola, Fla.	Oct. 27, 1879												68.0	14	68.5
Philadelphia, Pa.	Jan. 1, 1871	52.0	51.5	52.6	50.1	52.5	53.9	54.6	53.4	54.5	54.2	54.6	53.6	13	53.2
Pike's Peak, Colo.	Nov. 1, 1870			18.9	18.2	19.0	18.4	19.4	21.9	17.9	20.7	18.8	18.7	10	18.3
Pittsburg, Pa.	Nov. 1, 1870	50.0	50.4	51.7	48.8	51.5	52.8	52.8	52.1	53.4	54.0	52.8	51.9	13	51.8
Port Huron, Mich.	July 25, 1874				41.7	44.9	46.3	47.9	45.8	46.9	46.8	45.7	42.7	9	45.2
Portland, Me.	Jan. 15, 1871	42.6	43.7	44.9	44.1	48.0	48.8	49.1	47.1	48.7	48.4	48.0	46.4	12	46.7
Portland, Ore.	Nov. 1, 1871	51.7	52.6	53.6	53.8	53.1	53.9	53.8	53.4	50.4	52.5	51.5	51.7	13	52.5
Prescott, Ariz.	Nov. 19, 1878												52.6	6	52.8
Provincetown, Mass.	Feb. 15, 1882												47.9	1	47.9
Red Bluff, Cal.	July 1, 1877												61.5	5	62.7
Rio Grande City, Tex.	May 28, 1875	44.7	45.1	46.7	43.9	46.8	48.6	49.6	47.4	48.7	48.6	46.7	(1)	11	47.0
Rochester, N. Y.	Nov. 1, 1870												51.8	6	51.9
Roseburg, Ore.	July 15, 1877												58.8	6	59.2
Sacramento, Cal.	July 1, 1877												58.5	13	58.4
Saint Louis, Mo.	Nov. 1, 1870	54.1	53.7	54.3	53.9	55.4	56.4	57.4	55.7	56.1	55.9	55.6	53.6	13	55.4
Saint Michael's, Fort, Alaska	June 28, 1874												28.1	2	28.2
Saint Paul, Minn.	Nov. 1, 1870												45.6	11	44.0
Saint Vincent, Minn.	Sept. 6, 1880												34.4	8	33.4
Salt Lake City, Utah	Mar. 19, 1874	60.4	60.6	60.6	61.6	61.0	62.1	61.9	63.0	63.6	60.4	61.2	50.8	12	60.5
San Diego, Cal.	Nov. 1, 1871												51.1	9	51.1
Sandusky, Ohio	Aug. 2, 1877												51.2	6	51.2
Sandy Hook, N. J.	Dec. 10, 1873	54.1	53.9	54.8	49.1	51.9	53.8	53.4	51.6	53.5	53.8	52.7	51.0	10	53.0
San Francisco, Cal.	Mar. 8, 1871	64.8	65.0	65.7	65.8	64.3	67.8	68.6	67.4	68.0	67.8	68.1	64.4	13	66.7
Savannah, Ga.	Jan. 1, 1871	64.8	65.0	65.7	65.8	64.3	67.8	68.6	67.4	68.0	67.8	68.1	64.4	13	66.7
Shaw's Fort, Mont.	Apr. 1, 1880												42.5	8	41.7
Shreveport, La.	Sept. 2, 1871	63.7	64.5	65.0	65.2	64.7	64.8	65.6	64.9	65.6	66.4	66.2	65.8	12	65.6
Sill, Fort, Ind. T.	June 23, 1876												48.2	2	48.2
Sitka, Alaska	Mar. 30, 1881												61.2	4	61.2
Smithville, N. O.	Oct. 15, 1876												44.9	2	44.9
Spokane Falls, Wash.	Feb. 5, 1881												63.2	2	63.2
Stockton, Cal.	July 1, 1879												61.0	4	61.0
Thomas, Fort, Tex.	Sept. 23, 1876												61.3	4	61.3
Thomas, Camp, Ariz.	Sept. 23, 1877												61.3	4	61.3
Toledo, Ohio	Nov. 1, 1870	43.1	43.3	43.3	43.7	43.2	43.1	43.7	43.1	45.0	45.1	43.8	43.9	13	43.9

Vicksburg, Miss.	Nov. 8, 1874	55.1	55.8	56.0	54.3	52.7	(1)	52.2	53.4	50.3	52.2	(1)	50.6
West Point, Miss.	Sept. 10, 1871	55.0	54.8	55.9	52.2	54.4	55.0	55.1	55.5	55.9	54.9	54.0	55.7
West Point, Miss.	Nov. 1, 1870	55.0	54.8	55.9	52.2	54.4	55.0	55.1	55.5	55.9	54.9	54.0	55.0
West Lee, Annapolis, Colo.	Oct. 1, 1881	55.0	54.8	55.9	52.2	54.4	55.0	55.1	55.5	55.9	54.9	54.0	55.0
Wilmington, N. C.	Jan. 1, 1871	55.0	54.8	55.9	52.2	54.4	55.0	55.1	55.5	55.9	54.9	54.0	55.0
Yankton, Dak.	Apr. 1, 1873	55.0	54.8	55.9	52.2	54.4	55.0	55.1	55.5	55.9	54.9	54.0	55.0
Yuma, Ariz.	Nov. 16, 1873	55.0	54.8	55.9	52.2	54.4	55.0	55.1	55.5	55.9	54.9	54.0	55.0

<sup>1</sup> Record incomplete.

<sup>2</sup> Station closed.

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 p. m., and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1873, at 7.35 a. m., 4.35 p. m., and 11.00 p. m. (Washington time); and from November 1, 1873, to December 31, 1883, at 7.00 m., 3.00 p. m., and 11.00 p. m. (Washington time).

## APPENDIX 28.

Monthly and annual mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for the year ending June 30, 1884, deduced from observations taken at 7 a. m., 3 and 11 p. m., Washington time.

[The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. observations by three; the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	1883.							1884.					Annual mean.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Albany, N. Y.	72.8	66.9	61.2	56.9	44.9	31.0	23.6	23.6	35.8	47.8	59.1	73.5	50.1
Alpena, Mich.	63.2	61.7	52.8	42.7	32.6	23.2	12.7	15.3	22.3	37.2	43.5	61.5	39.6
Apache, Fort, Ariz.	70.3	62.4	63.8	50.6	41.1	28.9	24.9	40.2	42.5	47.5	55.6	68.9	51.6
Assinaboine, Fort, Mont.	64.2	64.0	54.2	38.9	23.1	22.8	12.1	8.3	22.5	41.1	57.0	68.3	39.7
Atlanta, Ga.	70.8	76.1	70.8	65.3	53.6	43.0	35.7	51.0	54.2	58.1	70.9	70.8	61.1
Atlantic City, N. J.	73.0	70.5	65.1	55.6	45.9	37.2	23.2	27.6	35.6	47.0	53.7	68.4	52.1
Augusta, Ga.	82.4	79.9	72.8	65.2	57.4	53.2	43.4	54.5	59.6	62.1	74.0	74.2	65.5
Baltimore, Md.	76.8	72.9	65.1	57.5	45.2	39.0	32.0	42.3	44.0	52.8	64.8	73.2	55.7
Barnegat City, N. J.	72.9	70.4	64.4	55.4	44.8	37.2	28.9	37.8	39.0	46.9	53.7	66.2	42.4
Bennett, Fort, Dak.	70.5	60.6	53.6	42.8	30.4	19.6	12.2	5.6	37.5	42.6	57.3	72.0	42.4
Benton, Fort, Mont.	62.5	57.0	53.2	41.1	30.7	23.0	13.9	8.9	24.6	34.2	53.4	69.4	43.6
Bismarck, Dak.	67.1	65.9	54.1	40.4	29.1	14.3	4.2	0.1	19.7	28.7	53.6	69.4	38.1
Black Island, R. I.	69.9	67.2	61.5	52.4	43.0	33.0	23.5	35.0	34.0	42.9	53.0	62.3	49.3
Boise City, Idaho	72.2	72.2	62.0	44.5	39.2	28.7	23.8	30.7	43.5	52.0	61.1	67.1	47.3
Boston, Mass.	71.3	67.6	59.8	47.4	33.5	23.7	13.1	34.8	39.6	42.7	53.8	66.0	47.3
Brownsville, Tex.	88.0	82.6	77.7	73.5	63.2	51.9	33.8	64.8	69.6	71.8	79.7	79.8	72.5
Buffalo, N. Y.	67.2	65.8	57.5	43.4	33.4	24.0	18.0	26.3	29.3	39.7	52.1	68.5	45.7
Buford, Fort, Dak.	66.4	64.9	53.5	38.9	22.4	14.9	6.3	0.1	19.6	33.9	49.1	69.5	37.2
Cañby, Ill.	77.7	74.8	68.0	60.2	50.0	42.1	27.9	42.0	47.0	56.2	63.4	72.7	57.2
Canby, Fort, Wash.	77.5	75.5	69.0	51.1	47.3	44.3	42.6	33.2	44.0	50.5	53.4	55.2	58.5
Cape Henry, Va.	77.7	75.5	70.3	58.3	45.1	38.3	24.3	46.7	46.8	52.0	63.3	71.1	53.6
Cape May, N. J.	77.6	77.6	69.2	54.9	43.3	33.7	21.6	39.5	40.0	48.2	59.8	67.6	51.3
Cape Mendocino, Cal.	62.0	53.6	50.7	52.5	50.4	49.4	45.1	45.7	47.5	49.0	52.0	64.9	41.2
Cedar Key, Fla.	83.7	83.7	73.7	76.3	63.8	53.5	51.6	63.4	66.7	69.0	77.0	78.2	71.2
Charleston, S. O.	83.4	79.9	74.3	69.0	58.4	50.0	43.6	53.7	58.4	62.3	74.8	78.2	60.6
Charlotte, N. C.	80.5	76.9	68.5	61.6	52.4	44.9	33.5	53.7	58.4	62.3	74.8	78.2	60.6
Chattanooga, Tenn.	74.4	70.4	64.1	54.1	41.7	33.5	24.2	46.6	53.7	62.3	74.8	78.2	60.6
Chesapeake, Wyo.	64.0	62.9	55.2	43.3	34.2	26.6	23.6	45.6	53.7	62.3	74.8	78.2	60.6
Chicago, Ill.	71.0	68.9	60.7	51.3	41.5	30.1	23.6	39.7	46.7	53.7	62.3	68.0	42.9
Chicago, N. Y.	72.1	72.1	64.7	53.7	41.5	30.1	23.6	39.7	46.7	53.7	62.3	68.0	42.9
Clatskanie, Ore.	74.9	72.1	64.7	53.7	41.5	30.1	23.6	39.7	46.7	53.7	62.3	68.0	42.9

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Cleveland, Ohio	73.7	62.9	51.9	48.1	32.5	19.5	38.6	25.6	43.5	57.7	68.5	48.5	0
Columbus, Ohio	72.4	61.7	54.7	45.1	43.0	30.5	34.5	27.1	42.5	51.2	72.7	48.5	0
Cumbeba, Port, Tex.	72.1	61.5	55.8	45.1	43.0	30.5	34.5	27.1	42.5	51.2	66.5	48.5	0
Custer, Port, Mont.	72.7	62.9	54.3	45.1	43.0	30.5	34.5	27.1	42.5	51.2	70.8	49.3	49.3
Dallas, Port, Tex.	72.8	62.9	54.3	45.1	43.0	30.5	34.5	27.1	42.5	51.2	72.0	49.3	49.3
Dayton, Wash.	62.1	52.9	40.1	34.3	32.8	21.8	15.1	38.9	32.9	50.7	59.7	49.3	49.3
Deadwood, Dak.	62.2	53.9	40.1	34.3	32.8	21.8	15.1	38.9	32.9	50.7	67.1	49.3	49.3
Delaware Breakwater, Del.	71.7	61.7	53.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Des Moines, Iowa	71.2	61.7	53.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	67.0	49.3	49.3
Denver, Colo.	73.6	62.4	43.7	38.0	32.5	16.0	21.5	34.6	43.7	58.8	70.0	49.3	49.3
Detroit, Mich.	72.2	61.1	43.7	48.3	34.3	21.3	21.5	34.6	43.7	58.8	70.4	49.3	49.3
Dodge City, Kans.	72.3	61.1	43.7	48.3	34.3	21.3	21.5	34.6	43.7	58.8	70.4	49.3	49.3
Dubuque, Iowa	72.5	61.1	43.7	48.3	34.3	21.3	21.5	34.6	43.7	58.8	70.4	49.3	49.3
Duluth, Minn.	62.0	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Eastport, Me.	62.3	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Elliot, Port, Tex.	74.5	65.1	55.3	48.5	33.3	30.7	35.6	45.5	51.9	61.5	72.1	51.6	51.6
El Paso, Tex.	70.6	61.1	50.3	45.7	32.4	20.7	10.0	32.1	32.1	48.4	68.6	57.7	57.7
Erie, Pa.	62.9	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Escanaba, Mich.	62.8	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Fort Smith, Ark.	73.6	61.9	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Galveston, Tex.	73.7	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Grand Haven, Mich.	62.9	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Grand Port, Ariz.	75.1	67.4	57.0	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Haiters, N. C.	73.3	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Helena, Mont.	62.7	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Huron, Dak.	62.7	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Indianapolis, Ind.	75.1	67.4	57.0	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Indianola, Tex.	62.5	52.3	44.1	38.5	37.0	14.1	7.6	32.1	32.1	48.4	68.6	57.7	57.7
Jacksonville, Fla.	73.2	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Kearney, Iowa	73.0	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Key West, Fla.	73.4	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Kitty Hawk, N. O.	73.4	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Knoxville, Tenn.	75.9	62.4	62.6	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
La Crosse, Wis.	63.1	57.7	44.9	37.1	24.3	21.1	11.4	32.1	32.1	48.4	68.6	57.7	57.7
La Grange, Wis.	72.3	62.4	52.0	44.0	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Leavenworth, Kans.	72.7	62.4	52.0	44.0	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Leaworth, Idaho	72.3	62.4	52.0	44.0	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Little Rock, Ark.	77.2	70.4	47.8	35.4	24.3	21.1	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Louisville, Ky.	72.9	61.0	52.6	48.4	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Los Angeles, Cal.	69.8	61.0	52.6	48.4	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Lynchburg, Va.	73.0	61.0	52.6	48.4	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Macon, Port, N. O.	73.0	61.0	52.6	48.4	34.3	24.3	11.4	32.1	32.1	48.4	68.6	57.7	57.7
Marion, Port, N. O.	62.0	54.2	44.7	35.6	24.9	21.1	10.9	32.1	32.1	48.4	68.6	57.7	57.7
Marquette, Mich.	72.8	62.3	52.3	48.3	32.6	31.5	24.9	39.0	47.2	64.0	63.4	41.0	41.0
Memphis, Tenn.	62.0	52.9	43.0	32.4	21.1	10.9	32.1	32.1	48.4	68.6	57.7	57.7	57.7
Mobile, Ala.	76.8	62.4	54.1	45.1	46.9	33.0	13.6	32.1	32.1	48.4	68.6	57.7	57.7
Mobile, Ala.	67.6	58.9	45.3	38.5	26.4	13.6	32.1	32.1	48.4	68.6	57.7	57.7	57.7

Observations began September 1, 1883.

**Observations begin  
For 20 days only.**

Observations re-commenced July 21, 1883.

**Record incomplete.**

**Record incomplete  
For 27 days only.**

**For 21 days only.**  
**For 28 days only.**

**For 30 days only.**

**For 30 days only.**  
**For 28 days only.**

**For 28 days only.**  
**For 16 days only.**

### REPORT OF THE CHIEF SIGNAL OFFICER.

*Monthly and annual mean temperature (in degrees Fahrenheit) at stations of Signal Service, United States Army, for year ending June 30, 1884, &c.--Cont'd.*

Stations.	1883.					1884.					Annual mean.		
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.		May.	June.
Montgomery, Ala.	82.4	83.3	76.0	71.2	59.0	50.6	40.5	50.4	59.9	69.4	74.9	76.9	69.9
Moorehead, Minn.	66.9	44.8	58.4	40.0	28.2	19.5	3.2	2.9	14.7	33.9	54.4	69.3	26.3
Mount Washington, N. H.	103.9	66.4	38.9	19.3	19.5	9.1	5.2	3.9	12.2	25.4	42.0	69.3	26.3
Nashville, Tenn.	74.1	68.9	68.9	62.9	50.9	43.8	30.1	46.0	49.1	54.8	58.9	72.1	58.3
New Haven, Conn.	71.1	67.1	60.1	48.0	44.1	31.5	22.2	36.1	33.6	46.4	55.9	68.1	48.0
New London, Conn.	71.2	67.9	61.1	50.9	44.1	31.5	26.1	33.6	36.8	46.4	55.8	68.1	48.0
New Orleans, La.	83.5	83.8	79.4	75.4	63.5	60.3	47.1	60.7	64.8	68.2	76.4	82.1	70.2
New York City	78.3	70.8	63.1	53.7	45.0	33.7	38.2	38.5	37.5	47.6	58.8	68.7	51.1
Norfolk, Va.	76.2	70.5	70.5	62.2	53.7	46.4	38.2	50.1	50.3	54.5	68.1	71.4	60.8
North Platte, Nebr.	72.9	69.7	60.0	44.7	38.0	29.5	12.4	16.7	34.0	44.5	57.9	68.4	46.8
Olympia, Wash.	61.8	56.6	56.6	48.7	45.7	39.8	39.1	42.4	42.4	51.0	64.5	72.3	48.2
Omaha, Nebr.	75.7	60.8	60.8	48.4	39.2	28.6	17.0	19.4	36.3	47.5	61.6	71.3	48.2
Owego, N. Y.	63.7	57.5	57.5	49.5	42.1	30.2	21.9	29.2	31.6	40.9	53.3	65.3	48.2
Palestine, Tex.	81.1	74.9	77.2	69.7	58.8	57.9	40.9	58.9	60.4	62.1	69.5	77.3	66.3
Pensacola, Fla.	82.3	81.0	77.2	73.2	61.5	57.9	49.4	46.4	48.8	58.3	74.3	79.3	66.3
Philadelphia, Pa.	76.1	64.5	64.5	55.3	47.4	37.1	29.5	40.8	41.5	48.7	61.3	70.5	53.7
Pike's Peak, Colo.	89.1	83.8	80.2	68.4	53.8	43.8	24.4	29.9	40.2	49.6	62.4	72.7	52.7
Pittsburg, Pa.	72.8	60.4	62.8	55.3	46.6	36.7	24.9	39.4	38.9	48.2	62.4	72.7	52.7
Port Huron, Mich.	68.9	56.5	56.5	47.0	38.8	27.1	18.6	23.5	28.9	39.6	53.3	65.4	43.8
Portland, Me.	67.9	59.2	59.2	44.2	42.0	37.7	22.4	29.7	33.7	46.7	53.9	62.7	47.2
Portland, Ore.	62.8	61.2	61.2	50.8	46.5	41.8	33.7	38.7	38.7	45.4	54.0	62.7	52.3
Prescott, Ariz.	70.1	64.5	64.5	49.9	42.5	40.1	37.0	38.5	40.8	46.4	54.7	62.8	51.4
Provincetown, Mass.	68.5	60.8	60.8	50.1	43.7	32.9	24.1	34.1	34.6	(*)	54.7	62.8	51.4
Red Bluff, Cal.			75.4	57.7	50.6	44.4	46.2	45.9	51.0	56.8	68.0	69.6	60.9
Rio Grande City, Tex.				79.1	63.3	61.2	52.1	52.1	72.2	76.1	80.1	84.6	60.9
Rochester, N. Y.				47.7	40.0	28.2	18.3	24.4	30.4	41.1	54.2	67.0	51.7
Roseburg, Ore.	67.0	60.3	60.3	49.9	45.4	40.0	39.1	38.4	45.7	51.4	58.9	68.8	51
Sacramento, Cal.	72.1	71.0	66.9	58.2	50.5	44.2	44.6	44.9	52.9	56.7	64.6	68.7	54.7
Saint Louis, Mo.	76.1	69.9	64.5	55.5	49.6	39.5	25.8	35.5	43.6	53.4	64.5	71.2	47.6
Saint Michael's, Fort, Alaska.	51.6	49.8	44.5	33.4	22.9	19.8	7.1	11.9	13.7	22.0	34.6	43.0	24.0
Saint Paul, Minn.	70.3	64.5	54.5	45.2	32.8	19.8	7.1	11.9	13.7	22.0	34.6	43.0	24.0
Saint Vincent, Utah	62.0	60.3	50.7	46.1	38.0	32.5	18.8	12.8	17.2	24.6	35.7	43.7	24.0
Salt Lake City, Utah	76.4	69.9	60.9	52.5	44.1	38.0	22.5	31.5	40.6	48.0	58.7	68.7	51.5
Salt Lake City, Utah	68.9	60.3	50.7	46.1	38.0	32.5	18.8	12.8	17.2	24.6	35.7	43.7	24.0
San Francisco, Cal.	68.9	60.3	50.7	46.1	38.0	32.5	18.8	12.8	17.2	24.6	35.7	43.7	24.0
Sandy Hook, N. J.	72.9	73.3	64.3	56.3	44.0	36.4	20.4	26.9	34.9	47.5	58.9	68.9	52.0

Sanford, Fla.....	53.5	75.5	67.3	62.5	55.6	65.3	68.4	69.7	76.9	76.3	71.5
San Francisco, Cal.....	57.9	62.1	53.5	50.2	50.0	50.0	54.0	55.0	58.3	58.0	55.5
Savannah, Ga.....	54.4	74.8	70.0	57.1	46.6	56.3	61.7	68.3	76.1	75.6	57.5
Shaw, Fort, Miss.....	62.1	80.4	30.0	28.6	21.9	8.5	28.0	40.4	52.9	63.0	40.8
Shreveport, La.....	83.0	74.5	57.9	52.3	38.9	88.7	59.5	63.8	71.6	79.4	65.6
Sioux Falls, S. D.....	52.2	45.5	23.4	36.4	38.8	81.7	57.5	44.8	45.9	51.4	43.7
Smithville, N. O.....	81.5	65.7	55.8	51.7	43.3	54.3	56.3	59.4	71.5	74.1	63.7
Spokane Falls, Wash.....	71.1	73.4	39.0	29.5	19.4	21.3	26.9	50.2	59.8	65.7	47.3
Springfield, Ill.....	74.9	68.8	44.3	33.8	20.8	32.1	40.0	51.8	62.3	71.8	51.5
Stockton, Fort, Tex.....	70.5	63.2	52.9	43.8	39.8	51.6	59.5	68.7	77.8	77.8	62.6
Stockton, Fort, Wash.....	73.7	70.4	55.0	42.8	41.5	36.6	42.7	49.2	50.9	53.3	61.1
Tatooch Island, Wash.....	81.4	75.7	58.9	44.5	40.7	47.5	51.9	54.5	65.7	77.0	49.4
Thomas, Camp, Ariz.....	69.2	60.6	48.6	45.5	40.7	29.9	35.3	45.7	59.8	70.7	40.2
Toledo, Ohio.....	73.5	51.8	44.2	32.7	20.0	29.9	35.3	45.7	59.8	70.7	40.2
Unalakleet, Alaska.....	49.9	46.0	36.3	30.6	23.6	38.5	33.7	36.5	39.3	45.7	40.2
Vicksburg, Miss.....	81.8	71.3	58.7	54.3	40.8	56.6	60.0	63.7	71.8	77.5	65.0
Washington City.....	76.8	72.1	65.9	36.9	29.4	40.9	42.3	50.9	64.4	73.5	54.6
West Las Animas, Colo.....	76.2	73.3	39.1	34.7	22.4	24.5	33.0	46.2	54.3	65.1	49.3
Wilmington, N. O.....	81.5	78.3	57.0	52.8	44.3	56.5	53.1	60.5	71.5	73.9	64.4
Yankton, Dak.....	71.9	70.6	66.0	24.1	13.5	12.1	29.9	43.5	59.6	71.7	44.7
Yuma, Ariz.....	92.1	91.0	85.7	(12)	54.6	57.3	60.0	57.4	75.3	81.7	.....

\* Station closed April 1, 1884.

\* Observations recommenced October 1, 1883.

\* For 27 days only.

\* Observations recommenced October 10, 1883.

\* Observations recommenced July 20, 1883.

\* For 25 days only.

\* Observations recommenced October 1, 1883.

\* No record.

\* For 30 days only.

\* For 29 days only.

\* For 28 days only.

\* For 25 days only.





Concho, Fort, Texas.	Oct. 10, 1875	48.9	24.4	58.3	65.4	73.6	80.3	82.1	78.4	72.6	65.1	51.2	46.1	63.8
Guster, Fort, Mont.	Dec. 4, 1878	18.8	37.7	33.7	44.8	54.5	63.8	70.7	70.6	56.1	61.6	81.6	20.6	44.5
Davis, Fort, Tex.	May 24, 1871	22.0	47.8	25.2	49.0	61.6	76.5	76.2	73.5	63.9	62.5	37.0	27.0	49.7
Dayton, Wash.	Dec. 34, 1877	31.0	80.2	43.0	61.4	65.0	70.5	68.0	68.8	99.1	47.4	36.8	44.4	49.8
Deadwood, Dak.	July 1, 1879	22.8	25.4	32.4	48.4	48.0	62.7	64.3	63.4	65.5	60.7	31.4	23.1	43.5
Delaware Breakwater, Del.	Dec. 1, 1877	32.1	32.1	40.4	48.3	48.3	56.7	63.5	72.5	65.8	49.9	47.4	37.8	53.9
Denver, Colo.	Jan. 28, 1880	32.1	32.1	38.3	48.4	48.4	63.5	73.8	73.7	63.2	53.9	37.2	30.6	43.9
Des Moines, Iowa.	Nov. 19, 1871	37.2	34.5	35.3	44.7	47.8	67.2	73.6	70.3	62.9	51.7	37.5	24.6	48.0
Detroit, Mich.	Aug. 1, 1878	24.8	33.8	32.4	47.8	61.2	63.6	74.6	75.4	66.9	55.0	38.5	21.6	43.0
Dodge City, Kans.	Sept. 15, 1874	16.7	22.7	24.7	38.3	48.8	53.4	60.8	66.0	62.3	51.3	38.1	25.8	48.3
Dubuque, Iowa.	July 10, 1873	11.8	17.4	23.4	33.4	43.8	55.1	60.8	60.8	56.6	44.9	29.0	16.8	38.9
Duluth, Minn.	Nov. 1, 1870	11.8	17.4	23.4	33.4	43.8	55.1	60.8	60.8	56.6	44.9	29.0	16.8	38.9
Eastport, Me.	Apr. 2, 1873	32.0	35.6	45.7	37.7	47.4	73.5	75.0	74.0	62.4	47.3	40.1	24.9	41.3
Elliot, Fort, Tex.	Nov. 25, 1879	46.0	50.3	56.4	63.8	72.9	81.3	81.6	78.7	63.8	63.8	60.6	46.2	63.3
El Paso, Tex.	Nov. 5, 1877	28.2	33.7	33.7	43.8	57.6	67.6	72.4	70.7	63.8	53.4	40.6	32.5	48.5
Elie, Pa.	May 25, 1873	15.1	16.9	28.0	35.6	49.4	60.5	65.2	65.2	56.2	45.0	31.1	20.7	40.5
Escanaba, Mich.	May 24, 1871	15.1	16.9	28.0	35.6	49.4	60.5	65.2	65.2	56.2	45.0	31.1	20.7	40.5
Fort Smith, Ark.	June 1, 1882	33.6	39.7	49.3	61.2	67.7	77.5	78.8	77.0	70.2	64.6	62.0	42.3	59.7
Galveston, Tex.	Apr. 16, 1871	53.2	57.1	63.8	69.5	76.4	82.5	84.4	83.6	79.3	72.6	61.9	46.2	70.1
Grand Haven, Mich.	Apr. 16, 1871	53.2	57.1	63.8	69.5	76.4	82.5	84.4	83.6	79.3	72.6	61.9	46.2	70.1
Grant, Fort, Ariz.	Nov. 24, 1871	25.5	33.4	31.2	43.5	55.5	64.4	69.5	68.5	60.6	50.4	37.2	29.3	47.0
Hatteras, N. C.	Nov. 1, 1875	42.9	45.8	52.5	58.2	67.0	76.4	77.2	74.5	61.4	49.2	49.2	45.1	59.9
Holena, Mont.	Oct. 15, 1879	16.1	21.4	34.9	55.4	65.6	74.9	78.8	77.9	75.3	67.6	56.1	23.7	43.4
Huron, Dak.	Dec. 1, 1880	43.5	47.0	48.9	55.4	65.6	74.9	78.8	77.9	75.3	67.6	56.1	23.7	43.4
Indianapolis, Ind.	Oct. 15, 1879	16.1	21.4	34.9	55.4	65.6	74.9	78.8	77.9	75.3	67.6	56.1	23.7	43.4
Indianola, Tex.	Feb. 10, 1871	80.0	83.7	80.8	82.7	84.3	82.1	82.7	81.0	77.8	73.0	62.0	56.3	70.2
Jacksonville, Fla.	Sept. 11, 1871	55.3	58.2	62.7	69.0	76.3	82.1	82.7	81.0	77.8	73.0	62.0	56.3	70.2
Keokuk, Iowa.	July 16, 1871	25.2	30.8	38.0	51.8	63.5	72.6	77.6	75.6	65.9	54.6	38.4	28.1	51.9
Key West, Fla.	Nov. 1, 1870	70.3	71.9	72.6	77.9	79.9	82.3	84.0	84.3	82.9	79.0	74.7	70.2	77.6
Kittyhawk, N. C.	Jan. 1, 1879	42.6	43.7	48.0	54.4	63.6	72.5	78.7	76.8	68.2	53.0	45.9	39.0	59.8
Knoxville, Tenn.	Jan. 1, 1871	38.2	42.1	48.0	54.4	63.6	72.5	78.7	76.8	68.2	53.0	45.9	39.0	59.8
La Crosse, Wis.	Oct. 15, 1872	16.6	22.9	31.7	46.7	60.5	73.5	76.7	74.8	63.4	49.9	33.4	22.9	43.4
Leavenworth, Kans.	May 21, 1871	26.5	32.8	40.8	53.5	65.1	74.0	77.5	71.4	61.0	49.9	33.4	22.9	43.4
Lewisville, Idaho.	July 1, 1879	41.6	48.1	54.0	63.4	70.3	78.4	80.3	78.2	71.4	65.4	51.4	30.7	56.6
Little Rock, Ark.	July 1, 1879	41.6	48.1	54.0	63.4	70.3	78.4	80.3	78.2	71.4	65.4	51.4	30.7	56.6
Los Angeles, Cal.	July 1, 1877	52.2	53.5	55.4	57.9	61.8	65.5	68.1	69.3	67.8	63.5	57.9	55.0	60.4
Louisville, Ky.	Sept. 11, 1871	33.8	39.0	44.4	55.6	67.2	74.9	79.1	76.3	68.6	58.2	44.9	36.7	54.8
Lynchburg, Va.	Sept. 24, 1871	37.1	40.5	45.9	56.0	66.5	74.7	78.9	75.8	68.6	58.2	44.9	36.7	54.8
Mackinaw City, Mich.	May 20, 1882	16.0	13.0	17.5	35.9	44.7	53.9	62.5	62.0	54.4	43.4	36.4	26.7	39.3
Macon, Fort, N. C.	Aug. 23, 1878	44.7	43.8	50.2	57.0	67.6	75.7	78.7	78.1	74.5	67.5	55.4	43.4	62.2
Maginnis, Fort, Mont.	July 14, 1882	13.7	17.8	31.2	38.5	44.6	53.4	60.6	65.1	53.7	45.7	31.2	22.3	41.3
Marquette, Mich.	May 2, 1871	17.7	19.2	24.3	37.1	42.1	53.5	60.1	69.0	60.7	48.4	31.2	22.3	41.3
Memphis, Tenn.	Feb. 28, 1871	41.4	43.0	52.0	61.3	70.9	78.3	82.3	80.9	76.7	63.0	58.2	49.0	67.1
Milwaukee, Wis.	Nov. 7, 1870	51.2	54.9	60.0	67.1	74.4	80.8	82.5	80.8	75.2	65.7	54.0	43.0	58.8
Mobile, Ala.	Nov. 9, 1870	44.8	52.8	57.5	64.8	73.2	79.7	82.5	80.8	75.2	65.7	54.0	43.0	58.8
Montgomery, Ala.	Jan. 1, 1881	2.4	2.8	17.4	17.4	33.6	33.6	47.8	47.8	53.7	53.7	60.4	10.9	36.7
Mount Washington, N. H.	Nov. 1, 1870	5.3	6.1	10.4	10.4	20.9	20.9	33.6	33.6	47.8	47.8	53.7	60.4	36.7
Nashville, Tenn.	Dec. 1, 1870	28.6	33.6	33.6	47.8	53.7	60.4	67.5	70.5	70.5	80.5	80.5	8.9	59.7
New Haven, Conn.	Dec. 10, 1872	25.7	28.7	35.4	45.1	56.4	66.8	72.1	70.5	63.3	53.6	40.7	31.7	50.0
New London, Conn.	Jan. 10, 1871	25.7	28.7	35.4	45.1	56.4	66.8	72.1	70.5	63.3	53.6	40.7	31.7	50.0

Table of mean temperatures (in degrees Fahrenheit) for each month and the year at the stations of observation of the Signal Service, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New Orleans, La.	Nov. 1, 1870	54.7	55.2	59.0	59.7	62.0	67.0	72.2	72.3	77.8	70.5	63.0	55.1	66.3
New York City	Nov. 1, 1870	30.2	31.4	36.8	47.0	50.1	56.7	72.7	72.3	75.3	65.9	42.6	33.0	51.3
Norfolk, Va.	Jan. 1, 1871	40.9	42.0	48.0	54.4	56.6	63.0	72.7	72.3	70.8	61.0	40.6	42.2	51.3
North Platte, Neb.	Sept. 18, 1874	20.8	27.2	35.8	47.6	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Olympia, Wash.	Sept. 1, 1877	52.4	52.3	44.4	47.6	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Omaha, Neb.	Nov. 1, 1870	21.3	27.6	35.7	47.6	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Owaseo, N. Y.	Nov. 1, 1870	21.3	27.6	35.7	47.6	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Palm Springs, Tex.	Nov. 1, 1870	21.3	27.6	35.7	47.6	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Pasadena, Fla.	Oct. 27, 1879	54.0	55.2	61.0	66.8	71.3	76.3	80.6	78.4	75.9	68.6	57.8	52.0	65.7
Philadelphia, Pa.	Jan. 1, 1871	31.6	33.7	39.5	47.8	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Pike's Peak, Colo.	Nov. 1, 1873	2.7	7.8	38.4	62.9	62.0	70.9	74.3	71.9	64.5	54.0	40.5	33.0	51.8
Pittsburg, Pa.	Nov. 1, 1870	30.9	32.8	38.4	47.8	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Port Huron, Mich.	Nov. 1, 1870	30.9	32.8	38.4	47.8	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Portland, Me.	Jan. 1, 1871	23.8	24.8	29.5	47.0	53.5	58.5	72.5	72.4	61.4	48.2	34.1	34.0	47.8
Portland, Ore.	Nov. 1, 1871	39.5	41.9	47.2	53.5	58.5	63.0	72.7	72.3	70.2	63.0	49.0	41.0	52.8
Prescott, Ariz.	Nov. 15, 1882	32.0	32.7	43.2	57.4	64.5	67.0	72.8	70.2	63.0	53.0	42.6	37.1	52.8
Provincetown, Mass.	Feb. 1, 1877	45.3	48.7	54.8	62.1	66.1	71.5	77.5	72.8	68.0	61.6	53.9	44.6	62.7
Red Bluff, Cal.	May 28, 1875	53.8	53.1	60.7	68.9	71.1	75.5	82.0	80.2	74.9	67.3	64.1	59.6	73.8
Rio Grande City, Tex.	July 15, 1877	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Roeburg, N. Y.	Nov. 1, 1870	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Rochester, N. Y.	Nov. 1, 1870	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Sacramento, Cal.	Nov. 1, 1870	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Saint Louis, Mo.	Nov. 1, 1870	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Saint Michael's, Fort, Alaska.	June 28, 1874	8.4	2.3	28.6	57.8	63.1	68.1	74.7	73.8	68.7	60.4	51.7	43.2	54.4
Saint Paul, Minn.	Nov. 1, 1870	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Saint Vincent, Minn.	Nov. 1, 1870	24.4	25.1	30.7	42.3	48.0	54.6	69.0	68.5	61.9	50.4	36.4	31.8	51.9
Salt Lake City, Utah	Mar. 18, 1874	28.7	4.7	23.1	43.8	50.7	57.0	67.0	64.3	58.5	48.9	30.9	18.9	44.0
San Diego, Cal.	Nov. 1, 1871	53.6	54.7	55.7	57.7	60.4	64.4	67.1	68.7	68.8	62.9	53.4	43.2	60.5
Sandusky, Ohio	Aug. 2, 1877	30.9	31.7	37.0	47.7	50.4	54.7	62.9	73.2	73.2	62.9	53.4	43.2	60.5
Sandy Hook, N. J.	Nov. 1, 1871	28.9	31.7	37.0	47.7	50.4	54.7	62.9	73.2	73.2	62.9	53.4	43.2	60.5
San Francisco, Cal.	Dec. 10, 1873	50.6	51.9	53.4	54.3	56.7	62.9	68.7	74.8	74.8	68.7	58.3	47.7	62.9
Savannah, Ga.	Jan. 1, 1871	52.0	53.4	55.7	56.6	58.5	62.9	68.7	74.8	74.8	68.7	58.3	47.7	62.9
Shaw, Fort, Mont.	Apr. 1, 1880	15.8	23.1	33.7	43.8	49.2	54.3	62.9	73.2	73.2	62.9	53.4	43.2	60.5
Shreveport, La.	Sept. 8, 1871	53.7	54.7	55.7	57.7	60.4	64.4	67.1	68.7	68.8	62.9	53.4	43.2	60.5
Still Point, Ind.	June 28, 1875	36.7	42.7	53.0	63.2	68.5	73.8	80.6	83.1	78.4	68.6	57.8	52.2	66.9
Sitka, Alaska	Nov. 1, 1875	47.4	49.6	54.1	60.8	64.5	68.1	72.5	70.7	68.3	62.9	53.4	43.2	60.5
Southville, N. C.	Oct. 15, 1875	34.0	38.8	44.4	50.8	54.3	58.5	64.3	68.7	73.2	68.6	57.8	52.2	66.9
Spokane Falls, Wash.	Feb. 6, 1881	29.3	33.1	39.6	48.4	53.0	58.5	64.3	68.7	73.2	68.6	57.8	52.2	66.9
Springfield, Ill.	July 1, 1870	29.3	33.1	39.6	48.4	53.0	58.5	64.3	68.7	73.2	68.6	57.8	52.2	66.9
Stockton, Fort, Tex.	Feb. 20, 1876	44.3	49.6	54.1	60.8	64.5	68.1	72.5	70.7	68.3	62.9	53.4	43.2	60.5

Thomas, Camp, Ariz.....	Sept. 22, 1877	53.7	60.2	68.8	78.4	82.4	73.9	72.8	54.1	47.1	42.8	51.3
Tulsa, Okla.....	Nov. 18, 1878	38.9	47.7	50.0	58.8	74.1	71.9	63.7	53.3	52.5	50.8	50.3
Uteah, Alaska.....	Aug. 18, 1878	30.3	34.1	30.5	44.4	49.4	50.4	45.6	40.0	33.6	31.7	33.8
Vicksburg, Miss.....	Sept. 10, 1871	53.8	59.1	65.6	72.4	81.0	80.5	74.8	68.3	58.0	56.3	58.7
Washington City.....	Nov. 1, 1870	38.1	42.0	41.8	52.7	73.1	74.8	67.6	57.8	44.0	33.5	53.0
West Las Animas, Colo.....	Oct. 1, 1881	28.0	41.8	49.6	64.4	75.0	73.0	64.4	58.8	38.3	30.6	48.6
Wilmington, N. C.....	Jan. 1, 1871	48.4	54.5	51.6	60.5	80.5	73.5	72.3	63.9	53.9	47.5	63.0
Yankee, Ark.....	Apr. 1, 1873	21.0	20.8	45.2	50.5	73.8	73.5	80.9	48.7	31.3	21.3	45.7
Yuma, Ariz.....	Nov. 18, 1873	58.0	65.0	77.2	88.2	92.5	91.1	84.3	73.1	68.5	56.0	72.3

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 p. m., and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1873, at 7.35 a. m., 4.35 p. m., and 11.00 p. m. (Washington time); and from November 1, 1879, to December 31, 1880, at 7.00 a. m., 2.00 p. m., and 11 p. m. (Washington time).

## APPENDIX 30.

Table showing the mean monthly and mean annual temperatures (in degrees Fahrenheit) at selected stations of the Signal Service, United States Army, deducted from the three telegraphic observations computed from January, 1874, to December, 1883, inclusive.)

[The daily mean is obtained by dividing the sum of the three telegraphic observations by three; the monthly mean by dividing the sum of the daily means by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	32.1	32.3	32.9	44.9	50.2	58.2	72.5	70.7	63.0	51.2	38.0	28.9	43.2
Alpena, Mich.	18.1	18.3	22.5	38.1	49.2	59.2	69.1	64.7	57.2	45.6	32.9	22.9	41.5
Atlantic City, N. J.	32.2	32.7	32.5	46.3	57.2	66.9	72.4	72.0	67.1	57.0	44.2	35.4	51.9
Augusta, Ga.	44.8	51.2	49.0	63.8	72.4	79.2	82.4	78.8	74.8	65.2	54.6	46.2	64.8
Baltimore, Md.	34.7	37.2	43.5	52.8	64.5	73.9	78.5	74.8	68.2	58.1	45.8	37.5	55.7
Barnegat City, N. J.	31.5	32.7	37.9	45.6	54.9	65.7	72.4	71.6	68.5	56.2	43.7	34.7	51.4
Boston, Mass.	34.4	35.2	34.2	43.1	54.3	65.9	72.4	69.2	62.3	51.8	39.7	30.2	48.4
Buffalo, N. Y.	34.8	37.2	39.1	49.3	58.4	68.9	74.6	71.3	69.3	60.8	46.7	39.5	53.5
Cairo, Ill.	40.8	41.4	43.0	58.4	68.3	75.4	78.2	77.5	69.3	60.9	48.7	43.4	58.9
Cape Henry, Va.	40.8	42.8	47.0	54.1	64.1	73.6	78.2	78.1	68.5	59.5	47.4	38.2	54.0
Cape May, N. J.	34.8	36.3	38.3	48.2	59.0	68.5	73.8	70.9	68.9	57.3	45.8	31.8	51.8
Charleston, S. C.	51.3	52.8	53.2	64.2	72.2	79.9	82.9	80.9	76.3	67.3	57.6	48.2	63.8
Cheyenne, Wyo.	24.6	26.0	32.8	40.4	50.8	60.8	67.8	71.8	68.1	53.1	39.6	30.3	46.2
Chicago, Ill.	28.3	29.3	30.9	45.4	57.3	68.8	72.6	70.2	64.0	53.1	40.8	30.6	53.1
Cincinnati, Ohio	31.1	32.8	34.0	44.8	56.2	67.1	71.8	70.0	63.1	50.2	37.8	28.4	49.8
Cleveland, Ohio	32.4	34.0	36.4	48.9	59.9	69.5	75.3	72.0	64.0	50.2	37.8	28.4	49.8
Des Moines, Iowa	27.1	28.2	30.4	43.9	56.1	67.1	71.9	70.2	62.9	52.2	38.9	30.0	45.5
Denver, Colo.	27.2	28.1	30.7	47.0	57.0	66.7	71.9	70.2	62.9	52.2	38.9	30.0	45.5
Detroit, Mich.	26.8	27.8	32.1	44.7	56.1	67.1	71.9	70.2	62.9	52.2	38.9	30.0	45.5
Galveston, Tex.	19.7	20.3	22.4	38.4	48.9	57.9	67.1	66.8	54.5	44.1	30.2	18.0	40.1
Grand Haven, Mich.	19.7	20.3	22.4	38.4	48.9	57.9	67.1	66.8	54.5	44.1	30.2	18.0	40.1
Indianapolis, Ind.	32.3	32.1	33.1	43.4	53.9	63.6	69.8	68.4	61.2	51.0	38.4	30.5	47.4
Indianapolis, Tex.	30.9	30.8	30.4	40.1	51.1	61.1	73.1	74.0	66.8	55.8	41.8	33.7	55.5
Jacksonville, Fla.	53.8	57.6	55.1	70.3	78.2	83.1	83.8	82.8	73.9	70.5	62.4	54.8	70.2
Jacksonville, Fla.	53.8	57.6	55.1	70.3	78.2	83.1	83.8	82.8	73.9	70.5	62.4	54.8	70.2
Key West, Fla.	24.0	24.0	24.0	34.0	44.0	54.0	64.0	74.0	84.0	94.0	104.0	114.0	70.0
Key West, Fla.	24.0	24.0	24.0	34.0	44.0	54.0	64.0	74.0	84.0	94.0	104.0	114.0	70.0
La Grange, Wis.	31.0	31.0	31.0	41.0	51.0	61.0	71.0	81.0	91.0	101.0	111.0	121.0	70.0
La Grange, Wis.	31.0	31.0	31.0	41.0	51.0	61.0	71.0	81.0	91.0	101.0	111.0	121.0	70.0

Leavenworth, Kans.	57.5	58.5	41.3	53.8	65.0	73.5	75.0	75.0	66.5	55.8	40.4	32.3	53.7
Louisville, Ky.	57.6	58.7	40.8	53.9	65.0	73.5	75.0	75.0	66.5	55.8	40.4	32.3	53.7
Lynchburg, Va.	57.8	58.9	40.9	54.0	65.1	73.6	75.1	75.1	66.6	55.9	40.5	32.4	53.8
Memphis, Tenn.	57.9	59.0	41.0	54.1	65.2	73.7	75.2	75.2	66.7	56.0	40.6	32.5	53.9
Milwaukee, Wis.	58.0	59.1	41.1	54.2	65.3	73.8	75.3	75.3	66.8	56.1	40.7	32.6	54.0
Montgomery, Ala.	58.1	59.2	41.2	54.3	65.4	73.9	75.4	75.4	66.9	56.2	40.8	32.7	54.1
Mount Washington, N. H.	58.2	59.3	41.3	54.4	65.5	74.0	75.5	75.5	67.0	56.3	40.9	32.8	54.2
Nashville, Tenn.	58.3	59.4	41.4	54.5	65.6	74.1	75.6	75.6	67.1	56.4	41.0	32.9	54.3
New Haven, Conn.	58.4	59.5	41.5	54.6	65.7	74.2	75.7	75.7	67.2	56.5	41.1	33.0	54.4
New London, Conn.	58.5	59.6	41.6	54.7	65.8	74.3	75.8	75.8	67.3	56.6	41.2	33.1	54.5
New Orleans, La.	58.6	59.7	41.7	54.8	65.9	74.4	75.9	75.9	67.4	56.7	41.3	33.2	54.6
New York City	58.7	59.8	41.8	54.9	66.0	74.5	76.0	76.0	67.5	56.8	41.4	33.3	54.7
New York City	58.8	59.9	41.9	55.0	66.1	74.6	76.1	76.1	67.6	56.9	41.5	33.4	54.8
Norfolk, Va.	58.9	60.0	42.0	55.1	66.2	74.7	76.2	76.2	67.7	57.0	41.6	33.5	54.9
Omaha, Nebr.	59.0	60.1	42.1	55.2	66.3	74.8	76.3	76.3	67.8	57.1	41.7	33.6	55.0
Owego, N. Y.	59.1	60.2	42.2	55.3	66.4	74.9	76.4	76.4	67.9	57.2	41.8	33.7	55.1
Philadelphia, Pa.	59.2	60.3	42.3	55.4	66.5	75.0	76.5	76.5	68.0	57.3	41.9	33.8	55.2
Pike's Peak, Colo.	59.3	60.4	42.4	55.5	66.6	75.1	76.6	76.6	68.1	57.4	42.0	33.9	55.3
Pittsburg, Pa.	59.4	60.5	42.5	55.6	66.7	75.2	76.7	76.7	68.2	57.5	42.1	34.0	55.4
Portland, Me.	59.5	60.6	42.6	55.7	66.8	75.3	76.8	76.8	68.3	57.6	42.2	34.1	55.5
Portland, Ore.	59.6	60.7	42.7	55.8	66.9	75.4	76.9	76.9	68.4	57.7	42.3	34.2	55.6
Saint Louis, Mo.	59.7	60.8	42.8	55.9	67.0	75.5	77.0	77.0	68.5	57.8	42.4	34.3	55.7
Saint Paul, Minn.	59.8	60.9	42.9	56.0	67.1	75.6	77.1	77.1	68.6	57.9	42.5	34.4	55.8
San Diego, Cal.	59.9	61.0	43.0	56.1	67.2	75.7	77.2	77.2	68.7	58.0	42.6	34.5	55.9
Sandy Hook, N. J.	60.0	61.1	43.1	56.2	67.3	75.8	77.3	77.3	68.8	58.1	42.7	34.6	56.0
San Francisco, Cal.	60.1	61.2	43.2	56.3	67.4	75.9	77.4	77.4	68.9	58.2	42.8	34.7	56.1
Savannah, Ga.	60.2	61.3	43.3	56.4	67.5	76.0	77.5	77.5	69.0	58.3	42.9	34.8	56.2
Shreveport, La.	60.3	61.4	43.4	56.5	67.6	76.1	77.6	77.6	69.1	58.4	43.0	34.9	56.3
Toledo, Ohio	60.4	61.5	43.5	56.6	67.7	76.2	77.7	77.7	69.2	58.5	43.1	35.0	56.4
Tulsa, Okla.	60.5	61.6	43.6	56.7	67.8	76.3	77.8	77.8	69.3	58.6	43.2	35.1	56.5
Vicksburg, Miss.	60.6	61.7	43.7	56.8	67.9	76.4	77.9	77.9	69.4	58.7	43.3	35.2	56.6
Washington City	60.7	61.8	43.8	56.9	68.0	76.5	78.0	78.0	69.5	58.8	43.4	35.3	56.7
Wilmington, N. C.	60.8	61.9	43.9	57.0	68.1	76.6	78.1	78.1	69.6	58.9	43.5	35.4	56.8
Yankton, Dak.	60.9	62.0	44.0	57.1	68.2	76.7	78.2	78.2	69.7	59.0	43.6	35.5	56.9

NOTE.—Observations from January 1, 1874, to November 1, 1879, taken at 7.35 a. m., 4.25 p. m., and 11.00 p. m. (Washington time), and from November 1, 1879, to December 31, 1880, at 7 a. m., 3 p. m., and 11.00 p. m. (Washington time).

## APPENDIX 31.

Table showing the mean monthly and mean annual temperatures (in degrees Fahrenheit) at selected stations of the Signal Service, United States Army, deduced from the three telegraphic observations (computed from January, 1879 to December, 1883, inclusive).

[The daily mean is obtained by dividing the sum of the three telegraphic observations by three; the monthly mean by dividing the sum of the daily means by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	23.8	27.2	33.8	44.6	61.5	68.8	73.3	71.0	64.3	53.9	40.8	30.9	48.7
Alpena, Mich.	19.4	19.2	24.8	35.8	49.4	53.5	63.6	64.4	54.9	47.3	32.3	28.0	41.4
Apache, Fort, Ariz.	33.5	37.9	45.1	50.3	57.2	67.5	71.5	69.4	63.2	52.1	39.6	27.1	52.0
Atlanta, Ga.	45.8	48.5	53.6	61.3	68.9	76.8	78.9	75.5	70.9	64.2	51.1	48.2	61.8
Atlantic City, N. J.	32.2	34.1	38.7	46.4	57.8	66.9	73.6	71.6	64.8	53.8	44.3	36.6	52.3
Augusta, Ga.	49.7	53.1	57.3	64.0	72.8	79.6	82.2	79.4	74.9	67.9	54.9	50.1	65.5
Baltimore, Md.	34.3	37.7	42.5	52.7	65.5	73.6	77.6	74.6	68.9	57.8	45.9	38.5	56.0
Barnegat City, N. J.	31.6	33.3	38.1	45.6	57.0	66.4	73.0	71.0	66.9	57.8	43.8	36.9	51.7
Bismarck, Dak.	6.3	12.1	22.1	40.0	55.2	65.4	68.0	67.9	55.6	42.5	25.2	11.1	39.4
Boston, Mass.	26.4	28.6	33.9	43.5	54.5	65.4	70.3	68.8	62.5	52.4	38.8	31.0	48.3
Brownsville, Tex.	59.6	62.0	68.1	74.9	79.6	83.3	84.2	82.3	78.9	75.4	65.4	58.3	73.1
Buffalo, N. Y.	24.7	25.3	29.8	39.8	53.4	63.0	68.5	68.6	64.3	52.7	38.7	30.3	46.6
Buford, Fort, Dak.	7.0	11.1	22.8	40.9	53.4	62.9	67.4	66.7	54.3	41.6	24.0	8.3	33.4
Calve, Ill.	37.2	41.8	48.5	59.4	69.1	76.2	81.4	77.4	69.3	62.6	47.1	38.7	59.0
Cape Henry, Va.	40.2	43.2	46.7	54.8	64.9	73.7	77.6	76.1	72.5	64.8	53.0	44.5	59.2
Cape May, N. J.	34.5	37.5	41.8	48.8	60.3	68.8	74.3	72.9	69.4	61.3	48.0	38.3	54.7
Charleston, S. C.	52.2	54.4	58.3	64.8	73.1	80.1	83.0	80.7	75.9	69.3	57.5	48.3	68.0
Charlotte, N. C.	42.0	45.2	50.6	59.1	68.9	76.9	78.7	78.4	70.3	60.3	49.6	43.7	60.6
Chattanooga, Tenn.	44.0	46.3	51.7	60.2	68.5	75.7	78.5	73.6	69.9	63.3	49.8	43.7	60.6
Cherone, Wyo.	25.1	28.9	34.5	41.3	50.5	61.1	68.4	65.0	55.8	43.3	32.2	26.3	44.3
Chicago, Ill.	25.1	29.6	35.8	45.7	57.3	65.1	73.2	71.9	63.4	55.0	39.2	27.9	48.3
Cincinnati, Ohio	35.5	39.4	44.2	54.4	65.3	73.5	78.0	73.1	68.4	60.8	45.6	38.1	56.1
Cleveland, Ohio	36.7	39.5	43.7	53.6	64.6	73.5	78.0	73.1	68.4	60.8	45.6	38.1	56.1
Columbus, Ohio	30.5	34.4	39.6	50.3	62.6	70.6	75.3	72.3	66.6	57.0	41.3	34.6	50.3
Canton, Port, Tex.	44.0	48.3	53.2	63.2	73.2	80.9	85.0	82.3	72.3	65.2	51.2	41.3	63.9
Denver, Colo.	23.9	28.6	34.1	43.4	52.9	62.7	72.6	72.1	63.1	54.0	40.4	33.4	48.6
Des Moines, Iowa	20.9	24.7	31.9	42.4	52.7	62.7	72.6	72.0	63.1	54.0	40.4	33.4	48.6
Detroit, Mich.	23.8	28.6	34.1	43.4	52.9	62.7	72.6	72.0	63.1	54.0	40.4	33.4	48.6
Indianapolis, Ind.	27.1	30.5	34.8	43.5	53.8	63.8	73.6	70.3	63.3	54.7	40.1	33.7	51.1
Indianapolis, Kans.	43.8	48.2	53.2	63.2	73.2	83.2	88.2	85.2	75.2	65.2	50.2	40.2	70.2
Ipswich, Iowa	19.7	25.3	34.0	44.3	61.1	68.5	73.4	71.7	64.3	54.3	40.7	33.7	48.3

Duluth, Minn.	11.8	15.9	25.2	37.6	48.3	58.7	66.2	64.9	55.8	46.5	29.3	38.7
Essexport, Me.	44.0	50.3	57.2	63.9	72.0	81.2	90.7	90.8	86.1	77.7	68.0	41.4
El Paso, Tex.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
El Paso, Pa.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Essexport, Mich.	11.8	15.9	25.2	37.6	48.3	58.7	66.2	64.9	55.8	46.5	29.3	38.7
Galveston, Tex.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Grand Haven, Mich.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Grant, Fort, Ariz.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Indianapolis, Ind.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Indianola, Tex.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Jacksonville, Fla.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Kootuk, Iowa	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Key West, Fla.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Kittyhawk, N. C.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Knoxville, Tenn.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
La Crosse, Wis.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Leavenworth, Kans.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Los Angeles, Cal.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Louisville, Ky.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Lynchburg, Va.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Marquette, Mich.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Memphis, Tenn.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Milwaukee, Wis.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Montgomery, Ala.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Mount Washington, N. H.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Nashville, Tenn.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
New Haven, Conn.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
New London, Conn.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
New Orleans, La.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
New York City	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Norfolk, Va.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
North Platte, Nebr.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Olympia, Wash.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Omaha, Nebr.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Orwego, N. Y.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Philadelphia, Pa.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Pike's Peak, Colo.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Pittsburg, Pa.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Portland, Me.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Portland, Ore.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Portland, Ariz.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Roseburg, Ore.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Sacramento, Cal.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Saint Louis, Mo.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Saint Paul, Minn.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Salt Lake City, Utah	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
San Diego, Cal.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Sandy Hook, N. J.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
San Francisco, Cal.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Savannah, Ga.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3
Shreveport, La.	38.2	43.8	49.7	55.8	62.0	68.1	74.6	70.0	63.6	56.8	49.1	38.3



Table showing the mean monthly and mean annual temperatures in degrees Fahrenheit at selected stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Smithville, N. C. ....	47.5	49.8	52.6	60.3	69.8	77.4	80.7	78.0	74.0	67.0	54.4	49.4	62.6
Stockton, Fort, Tex. ....	44.2	48.4	53.8	64.4	72.6	79.1	80.0	76.3	70.7	63.2	50.0	45.5	62.7
Toledo, Ohio. ....	38.4	31.7	38.7	47.5	60.9	69.0	73.8	71.6	64.8	55.7	40.9	32.2	51.1
Vicksburg, Miss. ....	50.3	53.4	60.1	68.5	72.7	80.2	81.3	79.9	74.4	68.7	55.4	52.0	64.3
Washington City. ....	32.6	36.6	41.4	51.9	63.1	72.1	77.1	74.3	63.7	59.5	44.7	39.6	55.1
Wilmington, N. C. ....	43.5	51.1	54.5	61.0	69.5	76.8	79.8	75.3	72.7	66.8	54.6	50.1	63.7
Yankton, Dak. ....	16.3	20.2	20.7	46.1	60.4	69.2	73.3	73.0	61.0	50.5	32.1	20.5	44.1

NOTE.—Observations from January 1, 1879, to November 1, 1879, taken at 7.35 a. m., 4.35 p. m., and 11.00 p. m. (Washington time), and from November 1, 1879, to December 31, 1882, at 7.00 a. m., 2.00 p. m., and 11.00 p. m. (Washington time).

Table showing the mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month of the year 1883.

[These means are obtained by dividing the sum of the daily ranges (as obtained from self-registering thermometers) by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Albany, N. Y.	18.7	14.3	15.5	15.0	17.0	16.5	16.9	17.5	17.0	16.0	13.4	12.8
Alexander, Fort, Alaska.	18.7	14.3	15.5	15.0	17.0	16.5	16.9	17.5	17.0	16.0	13.4	12.8
Alpena, Mich.	22.7	22.0	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Apache, Fort, Ariz.	22.7	22.0	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Asimabona, Fort, Mont.	22.7	22.0	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Atlanta, Ga.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Atlantic City, N. J.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Augusta, Ga.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Baltimore, Md.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Barnegat City, N. J.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Behring Island, Behring Sea.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Benton, Fort, Ark.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Bismarck, Dak.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Black Island, R. I.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Boston, Mass.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Brownsville, Tex.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Buffalo, N. Y.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Bufo, N. Y.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Burford, Fort, Dak.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Calve, Ill.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Camp, Fort, Wash.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Cape Henry, Va.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Cape May, N. J.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Cape Mendocino, Cal.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Cedar Key, Fla.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Charleston, S. C.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Charlotte, N. C.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Chattanooga, Tenn.	13.5	13.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0

<sup>1</sup> No record.

<sup>2</sup> Record incomplete.

<sup>3</sup> Sixteen days only.

<sup>4</sup> Twenty-six days only.

<sup>5</sup> Twenty-two days only.

<sup>6</sup> Twenty-five days only.

<sup>7</sup> Twenty-four days only.

<sup>8</sup> Station opened September 1, 1883.

<sup>9</sup> No later reports received.

Table showing the mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &amp;c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Cheyenne, Wyo.	22.3	22.7	24.3	20.7	23.9	27.6	20.1	20.2	26.4	20.9	22.8	22.3
Chicago, Ill.	16.8	15.8	14.5	14.5	15.1	13.5	16.5	12.8	12.3	11.0	15.4	15.1
Chincoteague, Va.	11.5	14.9	16.1	14.7	14.9	14.6	14.7	12.8	11.4	11.9	14.9	13.9
Cincinnati, Ohio.	14.5	16.9	16.1	17.2	17.2	15.1	16.2	15.8	14.5	12.1	15.0	14.9
Cleveland, Ohio.	15.4	17.1	17.1	17.3	18.7	16.2	16.5	16.3	16.7	13.9	16.0	14.6
Coleman City, Tex.	28.9	29.8	25.0	27.3	25.8	26.4	24.4	26.4	26.7			
Columbus, Ohio.	14.8	15.4	16.2	19.3	20.0	18.0	19.0	19.9	20.0	14.5	15.6	14.3
Concho, Fort, Tex.	29.6	21.1	25.4	26.0	27.1	25.6	23.7	27.5	23.8	18.3	22.0	22.3
Custer, Fort, Mont.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	35.5	37.3	25.1	27.9	23.1
Davenport, Iowa.	22.1	22.6	20.4	23.4	20.2	18.4	19.8	19.8	22.0	16.4	21.1	21.1
Dayton, Fort, Tex.	28.8	27.5	24.0	26.2	30.5	31.2	26.7	24.2	27.0	25.9	24.4	24.6
Dayton, Wash.	15.6	22.7	21.7	20.8	23.7	20.5	19.5	21.2	22.1	18.4	14.2	14.2
Deadwood, Dak.	27.1	23.3	23.9	15.1	16.5	13.1	11.8	11.6	18.3	13.5	21.5	17.3
Delaware Breakwater, Del.	10.7	12.3	12.5	11.9	13.1	11.8	12.6	20.1	10.0	9.9	13.0	11.6
Denver, Colo.	24.0	24.3	25.0	22.4	24.5	24.2	23.9	24.7	24.6	20.8	25.0	18.8
Des Moines, Iowa.	21.9	18.9	16.8	31.6	17.4	19.0	20.4	20.1	20.5	15.0	20.7	19.4
Detroit, Mich.	18.2	13.3	17.2	19.6	20.1	17.4	19.0	20.0	18.0	13.4	14.8	14.5
Dodge City, Kans.	24.9	22.5	22.4	23.4	25.2	24.1	22.1	19.0	22.4	17.2	23.7	21.9
Dubuque, Iowa.	19.6	19.0	17.4	21.7	19.1	18.8	20.1	20.6	21.7	13.2	17.4	17.0
Duluth, Minn.	20.5	21.9	20.7	14.8	13.6	17.9	17.3	13.6	21.7	16.4	16.7	16.7
Eastport, Me.	16.1	16.1	15.5	13.8	14.7	17.7	15.3	17.1	14.8	11.1	12.5	16.5
Elliot, Fort, Tex.	25.6	25.1	25.0	28.9	26.8	25.2	24.1	22.0	(1)	19.8	24.7	24.8
El Paso, Tex.	23.9	27.9	26.8	35.1	35.9	34.3	32.8	28.7	28.1	27.3	27.6	24.8
Escanaba, Mich.	21.2	21.4	17.4	15.2	17.4	16.9	13.8	14.9	15.3	12.3	12.4	12.6
Fort Smith, Ark.	20.3	20.9	23.4	27.9	16.7	17.1	17.1	19.8	18.5	13.9	16.0	13.5
Galveston, Tex.	13.6	11.8	11.1	9.5	10.1	9.5	10.3	23.2	27.2	18.0	22.9	20.2
Grand Haven, Mich.	12.1	14.7	17.0	16.4	15.2	15.0	12.0	14.1	15.0	9.3	10.6	11.3
Grant, Fort, Ariz.	21.4	20.3	20.9	26.8	25.6	27.0	21.8	20.6	21.1	12.1	14.0	13.2
Hatteras, N. C.	10.5	12.2	14.0	12.4	11.0	10.0	11.6	10.4	9.1	20.2	20.7	17.8
Helena, Mont.	23.3	17.6	18.3	18.1	19.0	20.9	22.0	21.3	21.1	12.1	13.3	13.6
Huron, Dak.	24.2	19.6	19.6	22.8	19.6	24.6	25.3	22.7	23.6	15.8	17.5	18.0
Indianapolis, Ind.	14.4	18.6	18.1	19.1	19.3	17.2	17.9	12.5	21.1	12.1	13.4	13.4
Indianola, Tex.	10.6	16.4	13.1	12.3	12.2	14.2	15.6	14.6	14.4	11.7	13.4	13.4
Johnson, Ark.	14.5	15.1	17.0	26.4	18.4	15.5	16.0	15.8	14.6	12.8	16.7	17.6
Kearney, Neb.	16.9	17.6	10.5	11.3	10.1	13.5	12.5	13.5	13.6	13.6	16.7	17.6
Kearney, N. C.	18.9	16.1	16.9	14.7	14.7	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Kearney, W. Va.	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
Kearney, W. Va.	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3

### REPORT OF THE CHIEF SIGNAL OFFICER.

Leavenworth, Kans.	18.0	19.5	23.5	31.1	39.8	39.9	20.0	21.9	17.1	20.9	19.2
Lawson, Ark.	12.8	16.3	22.9	23.0	28.5	30.0	29.6	27.2	18.3	16.1	12.5
Little Rock, Ark.	22.4	10.0	28.4	24.0	29.8	29.8	28.2	27.0	24.8	17.2	17.5
Los Angeles, Cal.	21.5	17.4	28.9	20.5	17.6	18.0	18.2	20.6	21.8	26.1	17.6
Louisville, Ky.	18.2	18.2	18.9	20.5	18.3	18.0	18.2	20.6	18.3	17.5	16.8
Lynchburg, Va.	12.7	15.4	22.4	21.6	18.3	18.7	20.7	16.8	14.3	18.7	17.2
Maclean City, Mich.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Macon, Fort N. C.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Madison, Fort Mont.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Margina, Fort Mont.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Marquette, Mich.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Memphis, Tenn.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Meriden, Conn.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Milwaukee, Wis.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Mobile, Ala.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Montgomery, Ala.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Moorehead, Minn.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Mount Washington, N. H.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Nashville, Tenn.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
New Haven, Conn.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
New London, Conn.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
New Orleans, La.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
New York City.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Norfolk, Va.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
North Platte, Nebr.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
North Platte, Nebr.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Olympia, Wash.	14.0	17.7	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Omaha, Nebr.	12.7	15.4	22.4	21.6	18.3	18.0	18.2	20.6	18.3	17.2	16.8
Ooniam (Point Barrow), Alaska	20.8	18.9	19.3	15.7	22.3	37.4	19.1	17.9	15.5	23.3	19.5
Oswego, N. Y.	14.8	17.2	17.3	15.5	13.6	9.4	9.7	16.8	14.9	15.0	15.2
Oswego, N. Y.	10.0	15.0	17.3	15.4	12.6	19.5	18.4	16.8	16.3	15.0	15.2
Palestine, Tex.	19.2	18.1	18.9	19.8	18.5	18.2	19.9	21.4	21.0	17.1	17.1
Pensacola, Fla.	14.1	13.2	16.7	14.0	16.0	11.6	13.8	14.6	15.0	16.2	16.0
Philadelphia, Pa.	11.7	12.5	16.1	14.0	18.5	15.8	15.9	14.7	14.7	13.5	12.7
Pike's Peak, Colo.	13.6	11.7	14.7	14.0	18.5	15.8	15.9	14.7	14.7	13.5	12.7
Pittsburg, Pa.	15.0	17.7	18.1	20.0	22.2	19.2	20.8	21.0	20.7	17.3	16.5
Port Huron, Mich.	14.9	16.7	18.1	16.2	17.4	18.2	18.0	18.9	16.4	14.1	15.0
Portland, Me.	15.9	17.5	18.8	16.2	17.4	16.3	17.4	16.5	16.2	15.4	14.6
Portland, Me.	11.8	16.2	20.7	16.9	21.3	22.5	23.0	19.6	18.7	12.6	10.8
Portland, Ore.	28.4	24.9	24.3	33.0	38.5	26.1	27.1	36.0	29.1	34.7	21.3
Prescott, Ariz.	11.2	11.8	14.3	14.3	16.0	18.3	18.6	10.1	14.8	12.5	12.6
Provincetown, Mass.	21.7	22.4	24.4	20.7	27.8	31.1	31.3	28.3	18.9	20.3	18.7
Red Bluff, Cal.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	19.9	17.8	18.6
Rio Grande City, Tex.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	19.4	22.4	18.6
Rochester, N. Y.	14.1	14.9	17.2	16.2	18.6	30.3	25.6	23.0	14.4	11.6	10.7
Roseburg, Ore.	13.7	18.2	17.6	23.5	27.5	27.5	28.1	27.7	21.1	22.0	17.0
Sacramento, Cal.	15.6	20.0	22.2	19.9	20.5	23.1	29.9	23.8	13.3	17.7	18.0
Saint Louis, Mo.	16.1	17.2	20.5	21.0	20.5	18.3	18.9	21.2	7.7	14.1	13.1
Saint Michael's, Alaska	11.6	12.9	13.0	12.2	12.3	11.7	12.1	9.1	8.2	14.1	17.4
Saint Michael's, Alaska	20.5	22.1	21.3	20.5	20.3	20.4	19.5	18.6	14.7	21.2	17.4
Saint Paul, Minn.	22.9	25.5	25.5	19.4	22.9	24.4	22.2	24.9	16.0	16.9	20.5
Saint Vincent, Minn.	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Salt Lake City, Utah	15.2	16.6	16.6	19.3	21.8	21.8	21.8	21.8	15.0	15.0	14.1

<sup>14</sup> Station closed August 7, 1883.  
<sup>15</sup> Station closed June 15, 1883.  
<sup>16</sup> Station reopened October 10, 1883.

<sup>2</sup> Observations discontinued September 5, 1883.  
<sup>1</sup> Observations recommenced July 21, 1883.  
<sup>3</sup> Twenty-one days only.

<sup>1</sup> No record.  
<sup>2</sup> Twenty-five days only.  
<sup>3</sup> Twenty-three days only.

Table showing the mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &amp;c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
San Diego, Cal.....	18.3	16.5	9.7	15.0	13.8	13.3	11.5	12.4	15.3	14.4	17.5	16.7
Sandusky, Ohio.....	14.1	15.5	14.9	(1)	(1)	(1)	(19)	14.3	13.4	12.1	15.3	12.4
Sandy Hook, N. J.....	10.0	11.4	14.6	13.0	14.3	16.0	15.7	14.8	12.4	10.8	12.2	11.7
Sanford, Fla.....	(8)	(2)	(2)	18.0	16.9	16.9	19.1	16.8	14.6	12.5	13.8	19.8
San Francisco, Cal.....	8.8	11.0	9.4	10.3	12.1	12.4	9.5	10.5	13.6	10.0	9.3	9.3
Savannah, Ga.....	14.7	16.0	17.2	14.0	15.8	14.6	14.8	14.0	14.0	13.9	17.3	15.9
Shaw, Fort Mont.....	22.5	21.9	27.9	24.2	21.4	23.6	32.1	30.8	28.8	16.3	21.3	19.5
Shreveport, La.....	15.9	17.9	20.2	21.8	22.0	21.5	23.0	23.9	25.4	18.9	17.3	16.7
Sill, Fort Ind. T.....	21.4	20.9	23.0	25.8	25.7	23.2	22.4	10.4	10.5	(1)	(1)	(1)
Sitka, Alaska.....	10.2	12.5	12.5	11.6	12.6	10.7	9.8	10.4	10.5	9.7	11.3	11.1
Smithville, N. C.....	13.1	14.0	16.4	12.2	15.7	12.1	12.0	12.0	11.7	12.9	15.2	15.6
Spokane Falls, Wash.....	414.9	21.3	22.9	20.3	23.4	29.4	31.6	30.7	28.2	18.7	14.6	13.2
Springfield, Ill.....	18.0	17.6	20.1	22.5	30.4	17.0	18.8	18.5	22.5	13.8	18.8	18.4
Stockton, Fort, Tex.....	33.4	23.6	23.4	32.9	30.8	30.0	28.6	29.2	25.4	23.8	27.0	23.9
Tatoosh Island, Wash.....									(2)	9.0	5.9	6.3
Thomas, Camp, Ariz.....	25.8	23.2	24.7	33.6	26.5	37.3	27.2	27.0	31.8	34.9	34.4	23.3
Toledo, Ohio.....	14.1	15.2	18.5	17.5	18.2	15.3	17.0	17.3	16.6	13.8	16.0	14.1
Unalakleet, Alaska.....	(1)	(1)	(1)	13.2	12.5	12.9	13.1	12.5	9.5	11.3	10.7	9.3
Vicksburg, Miss.....	28.7	29.3	24.0	34.6	34.9	37.3	28.9	28.5	36.0	(15)	17.5	19.0
Washington City.....	15.8	18.1	18.7	18.3	19.4	18.7	19.0	21.5	22.2	17.5	19.0	17.8
West Las Animas, Colo.....	12.4	16.3	19.6	18.9	22.1	20.6	20.5	19.8	18.5	16.2	16.8	15.0
Wilmington, N. C.....	34.7	33.1	35.7	33.4	31.8	30.9	31.6	29.2	32.0	29.5	39.5	28.4
Yankton, Dak.....	15.1	18.9	19.7	16.4	17.6	13.9	15.6	15.0	13.4	15.0	18.2	18.8
Yuma, Ariz.....	20.3	19.6	20.3	21.4	18.0	21.3	19.8	18.9	21.3	16.7	24.3	21.2
	23.1	22.5	24.5	30.5	33.0	34.4	28.4	26.5	30.3	25.8	23.7	(1)

1 No record.

2 Record incomplete.

3 Twenty-six days only.

12

13

14

15 Reduced to a third-class station October 10, 1883.

16 Station closed March 31, 1883.

17 Station reopened July 20, 1883.

18 Nineteen days only.

19 Observations commenced October 1, 1883.

20

## APPENDIX 33.

Table of comparative mean temperatures (in degrees Fahrenheit) at stations of the Signal Service, United States Army.

[The daily mean is obtained by dividing the sum of the three telegraphic observations by 3; the monthly mean by dividing the sum of the daily means by the number of days in the month.]

Stations.	January.			February.			March.			April.			May.			June.		
	Mean to In-	Departure +	or -.	Mean to In-	Departure +	or -.	Mean to In-	Departure +	or -.	Mean to In-	Departure +	or -.	Mean to In-	Departure +	or -.	Mean to In-	Departure +	or -.
	clude 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.	Mean for 1882.	Mean for 1883.
Albany, N. Y.	23.1	+0.2	24.6	28.7	+3.9	32.9	30.1	-2.8	44.7	47.3	+2.6	50.1	-0.2	50.8	57.8	72.0	+4.2	72.0
Alpena, Mich.	18.2	-4.9	19.5	16.1	-3.4	25.0	18.4	-6.6	36.2	36.1	-1.1	40.4	-4.8	36.1	53.4	58.7	-0.7	58.7
Apache, Fort, Ariz.	33.9	-2.0	37.5	38.3	+1.8	44.5	47.5	+3.0	50.8	48.0	-2.8	57.4	-1.0	57.1	67.1	68.0	-1.9	68.0
Assinaboine, Fort, Mont.	12.0	4.9	20.4	9.5	+10.9	31.6	28.4	-3.2	41.5	41.6	+0.1	51.7	-2.2	51.7	62.7	62.7	-0.2	62.7
Atlanta, Ga.	45.6	-4.2	48.2	49.8	+1.6	54.6	49.6	-5.0	61.3	61.2	-0.1	69.4	-2.4	69.4	76.4	75.9	-0.5	75.9
Atlantic City, N. J.	30.1	-2.3	33.6	35.1	+1.5	38.9	35.0	-3.9	46.4	45.5	-0.9	57.2	-0.5	57.2	66.8	67.2	+0.4	67.2
Augusta, Ga.	47.7	+9.2	50.2	56.7	+6.5	56.3	53.8	-2.5	63.0	64.5	+1.5	72.6	-2.1	72.6	79.0	79.0	-0.2	79.0
Baltimore, Md.	34.8	-2.5	37.0	33.2	+2.1	42.4	39.4	-3.0	53.0	52.1	-0.9	64.0	-0.6	64.0	74.6	74.6	+0.8	74.6
Barnegat City, N. J.	32.3	-0.7	32.4	33.2	+2.4	38.1	36.0	-2.1	43.5	46.0	+2.5	56.8	-0.4	56.8	67.8	67.8	-1.1	67.8
Bennett, Fort, Dak.	12.0	5.5	21.5	16.1	+5.4	28.1	23.8	-4.3	41.9	45.6	+3.7	58.8	-7.5	51.3	67.2	66.1	-1.1	67.2
Benton, Fort, Mont.	11.7	-6.5	21.5	17.0	-4.1	28.9	33.4	+4.5	42.8	43.2	+0.4	53.5	-0.4	53.5	63.0	64.8	+1.8	64.8
Bismarck, Dak.	7.1	-2.6	9.7	13.2	-5.4	22.0	21.4	-0.6	30.9	41.3	+1.4	53.5	-0.4	53.5	63.0	64.8	+1.8	64.8
Black Island, N. I.	30.5	-2.9	36.0	32.1	-5.4	42.7	46.2	+3.5	50.6	42.6	-8.0	51.0	-0.4	51.0	61.5	61.4	-0.1	61.5
Bolton, Mass.	21.0	-9.9	28.2	21.3	-14.9	37.4	32.0	-5.4	42.8	42.6	-0.2	51.0	-0.4	51.0	61.5	61.4	-0.1	61.5
Bolton, N. Y.	25.4	-4.7	26.8	25.8	+1.2	34.5	31.3	-3.2	43.9	44.3	+0.4	56.6	-0.4	56.6	66.0	66.0	-0.4	66.0
Brownsville, Tex.	60.1	-55.4	47.7	62.8	-13.0	60.3	67.5	+7.2	74.9	74.3	-0.6	79.8	-0.6	79.8	83.3	83.3	-0.4	83.3
Buffalo, N. Y.	25.4	-4.5	25.5	22.3	-2.2	31.4	24.0	-7.4	41.5	40.2	-1.3	54.1	-0.4	54.1	64.6	64.6	-0.4	64.6
Burlington, Vt.	32.3	-4.1	40.9	36.8	-7.8	47.9	43.8	-4.1	58.3	59.9	+1.6	68.4	-0.6	68.4	78.9	78.9	+0.4	78.9
Cairo, Ill.	36.4	-4.1	40.9	36.8	-7.8	47.9	43.8	-4.1	58.3	59.9	+1.6	68.4	-0.6	68.4	78.9	78.9	+0.4	78.9
Cape Henry, Va.	34.3	-3.8	44.5	45.2	+4.3	47.5	42.9	-4.6	51.3	53.1	+1.8	64.1	-0.6	64.1	73.5	73.5	+0.4	73.5
Cedar Key, Fla.	58.5	+2.0	60.5	60.9	+4.7	64.8	61.3	-3.5	70.4	72.6	+2.2	76.9	-0.6	76.9	80.3	80.3	+0.6	80.3
Charleston, S. C.	48.4	-2.0	52.3	57.0	+4.7	58.1	53.8	-4.3	64.5	61.0	-3.5	70.4	-0.6	70.4	78.9	78.9	+0.4	78.9
Charlotte, N. C.	42.7	-3.0	43.6	48.5	+2.0	51.6	48.6	-3.0	59.1	59.0	-0.1	69.0	-0.6	69.0	77.2	77.2	+0.6	77.2
Chattanooga, Tenn.	41.6	-3.0	45.4	49.3	+3.9	52.3	49.3	-3.0	60.9	61.4	+0.5	69.0	-0.6	69.0	77.2	77.2	+0.6	77.2
Cheyanne, Wyo.	25.4	-4.4	29.0	28.9	-10.1	32.1	37.1	+5.0	45.9	45.6	-0.3	51.3	-0.6	51.3	61.8	61.8	-0.4	61.8
Chicago, Ill.	26.4	-10.1	29.6	30.0	-6.6	35.5	31.4	-4.1	43.9	45.6	+1.7	59.1	-0.6	59.1	68.7	68.7	-0.4	68.7
Chicot, Ark.	16.3	-0.5	37.4	40.2	+2.8	42.4	38.7	-3.7	49.7	49.1	+0.6	59.7	-0.6	59.7	68.7	68.7	-0.4	68.7
Chicot, Ark.	33.4	-3.9	37.8	38.3	+0.5	43.9	40.1	-3.8	54.6	55.1	+0.5	62.6	-0.6	62.6	74.3	74.3	-0.4	74.3
Cincinnati, Ohio	30.9	-2.5	34.5	37.5	+1.0	41.5	38.4	-3.1	48.3	48.0	-0.3	57.4	-0.6	57.4	67.8	67.8	-0.4	67.8
Cleveland, Ohio	37.8	-2.3	39.5	41.5	+1.0	43.5	40.1	-3.4	51.3	51.0	-0.3	60.9	-0.6	60.9	74.3	74.3	-0.4	74.3

Table of comparative mean temperatures (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	January.		February.		March.		April.		May.		June.	
	Mean to in- clude 1882.	Departure + or —.	Mean to in- clude 1882.	Departure + or —.	Mean to in- clude 1882.	Departure + or —.	Mean to in- clude 1882.	Departure + or —.	Mean to in- clude 1882.	Departure + or —.	Mean to in- clude 1882.	Departure + or —.
Columbus, Ohio.....	31.5	-4.9	34.5	-0.6	40.7	-5.7	50.3	-0.1	64.6	-5.1	70.8	-5.1
Coneho, Fort, Tex.....	44.0	40.7	43.4	5.6	58.9	-3.5	63.6	-2.2	71.5	-5.0	80.3	-8.8
Davenport, Iowa.....	22.6	15.5	23.0	-3.6	35.3	-0.6	48.7	-3.0	57.0	-2.5	68.3	-2.4
Dayton, Fort, Tex.....	45.2	42.0	43.0	-2.3	55.0	-1.4	61.3	-3.1	68.3	-0.7	75.0	+0.8
Dayton, Wash.....	32.5	28.5	34.3	-6.0	42.1	-1.5	49.2	-3.1	56.4	-1.9	65.0	+0.8
De-dward, Dak.....	23.6	15.8	26.4	-7.8	32.3	-0.2	40.5	-2.9	54.5	-7.1	64.0	+2.4
Delaware Breakwater, Del.....	32.9	31.6	33.4	-0.5	41.6	-0.2	48.6	-1.3	58.0	-1.4	68.0	+0.8
Denver, Colo.....	27.1	28.4	32.0	-11.0	39.4	-0.3	48.8	-0.7	54.2	-2.7	64.9	+2.1
Des Moines, Iowa.....	23.9	8.4	26.4	-0.9	33.1	-3.0	44.5	-0.2	59.5	-4.1	67.9	+0.7
Detroit, Mich.....	25.1	21.7	20.2	-8.0	32.8	-1.5	45.6	-0.3	54.0	-3.2	67.5	+1.1
Des Moines, Iowa.....	27.3	22.1	24.8	-7.2	33.7	-2.8	47.6	-1.7	58.1	-7.3	70.5	+1.1
Dodge City, Kans.....	20.7	10.2	18.8	-5.2	33.7	-2.8	47.6	-1.7	58.1	-7.3	70.5	+1.1
Dubuque, Iowa.....	17.7	1.8	15.1	-10.9	24.8	-2.2	38.1	-0.3	47.4	-0.7	57.5	+1.7
Duluth, Minn.....	20.1	16.2	10.9	-5.3	29.1	-1.2	37.7	-0.3	47.4	-0.7	57.5	+1.7
Eastport, Me.....	33.3	28.0	31.6	-5.3	40.0	-4.8	56.7	-0.9	63.0	-1.8	71.5	+1.7
Elliott, Fort, Tex.....	49.9	42.5	40.0	-1.4	57.4	-0.7	64.6	-0.8	73.3	-1.2	81.0	+0.5
El Paso, Tex.....	28.7	24.1	27.3	-1.0	34.3	-2.8	44.1	-0.3	53.9	-1.8	67.1	+1.2
Evie, Pa.....	51.0	51.0	51.0	-4.9	57.3	-0.2	63.6	-1.2	70.5	-0.9	77.7	+0.4
Galveston, Tex.....	53.4	51.0	51.0	-2.0	57.3	-0.2	63.6	-1.2	70.5	-0.9	77.7	+0.4
Grand Haven, Mich.....	28.0	20.4	23.6	-3.0	31.5	-2.3	43.4	-1.2	50.6	-0.9	62.1	+1.5
Grant, Fort, Ariz.....	43.5	40.5	40.5	-3.0	46.2	-1.8	53.4	-1.2	61.5	-0.9	70.5	+1.5
Hatteras, N. C.....	43.9	42.8	43.9	-1.1	46.2	-1.8	53.4	-1.2	61.5	-0.9	70.5	+1.5
Helena, Mont.....	18.5	+3.6	25.1	-11.0	35.2	-2.5	44.1	-1.2	53.4	-1.2	62.1	+1.5
Huron, Dak.....	17.6	2.0	21.7	-14.7	30.0	-2.7	44.1	-1.2	53.4	-1.2	62.1	+1.5
Indianapolis, Ind.....	30.5	24.6	32.0	-1.0	40.0	-2.5	52.6	-1.2	61.5	-1.2	70.5	+1.5
Indianola, Tex.....	53.8	49.2	54.3	-4.6	62.2	-0.4	70.5	-1.2	78.7	-1.2	87.1	+1.5
Jacksonville, Fla.....	54.1	57.9	57.9	-1.8	62.2	-0.4	70.5	-1.2	78.7	-1.2	87.1	+1.5
Knox, Iowa.....	26.1	15.5	24.9	-0.5	38.2	-2.9	51.1	-1.2	60.6	-1.6	69.7	+1.5
Kearney, Nebr.....	70.2	72.3	73.0	-1.1	77.7	-1.2	87.1	-1.2	96.0	-1.6	105.0	+1.5
Kitty Hawk, N. C.....	42.9	40.4	40.4	-2.5	46.2	-1.8	53.4	-1.2	61.5	-0.9	70.5	+1.5
Knoxville, Tenn.....	38.2	38.1	38.1	-1.1	46.2	-1.8	53.4	-1.2	61.5	-0.9	70.5	+1.5
La Crosse, Wis.....	18.6	4.9	23.0	-12.9	37.2	-3.7	46.2	-1.2	53.4	-1.2	62.1	+1.5
Leavenworth, Kans.....	27.1	18.6	27.1	-1.1	37.2	-3.7	46.2	-1.2	53.4	-1.2	62.1	+1.5
Little Rock, Ark.....	37.1	37.1	37.1	-1.1	46.2	-1.8	53.4	-1.2	61.5	-0.9	70.5	+1.5
Little Rock, Ark.....	40.4	40.4	40.4	-1.1	46.2	-1.8	53.4	-1.2	61.5	-0.9	70.5	+1.5
Los Angeles, Cal.....	51.0	51.0	51.0	-4.9	57.3	-0.2	63.6	-1.2	70.5	-0.9	77.7	+0.4





Table of comparative mean temperatures (in degrees Fahrenheit) at stations of the Signal Service, United, States Army—Continued.

Stations.	January.			February.			March.			April.			May.			June.		
	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.
Thomas Camp, Ariz.....	39.8	40.2	+0.4	48.6	46.3	-0.3	52.4	56.4	+4.0	60.9	58.0	-2.9	69.1	67.9	-1.2	78.6	81.7	+3.1
Toledo, Ohio.....	28.2	22.3	-5.9	30.0	28.3	-1.7	36.3	31.7	-4.6	47.7	47.4	-0.3	59.2	57.8	-1.4	69.8	69.7	-0.1
Vicksburg, Miss.....	48.5	47.7	-0.8	52.7	54.0	+1.3	58.2	57.1	-1.1	65.6	66.3	+0.7	73.7	71.0	-2.7	80.1	80.0	-0.1
Washington City.....	38.5	29.6	-8.9	36.0	37.5	+1.5	42.3	37.6	-4.7	52.8	50.3	-2.5	64.4	63.6	-0.8	73.6	74.4	+0.8
Washington, N.C.....	47.0	47.2	+0.2	49.0	54.7	+5.7	54.8	50.8	-4.0	61.7	61.3	-0.4	69.6	69.0	-0.6	76.8	77.2	+0.4
Yankton, Dak.....	16.5	7.4	-9.1	21.5	17.2	-4.3	26.8	29.5	+2.7	44.9	47.9	+3.0	60.2	53.7	-6.5	64.5	67.0	+2.5
Yuma, Ariz.....	53.8	51.7	-2.1	59.5	55.6	-3.9	64.7	67.3	+2.6	69.5	67.1	-2.4	77.6	74.4	-3.2	86.0	87.8	+1.8

Table of comparative mean temperatures (in degree Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	July.			August.			September.			October.			November.			December.		
	Mean to in- clude 1882.	Departure + or -.	Mean for 1883.	Mean to in- clude 1882.	Departure + or -.	Mean for 1883.	Mean to in- clude 1882.	Departure + or -.	Mean for 1883.	Mean to in- clude 1882.	Departure + or -.	Mean for 1883.	Mean to in- clude 1882.	Departure + or -.	Mean for 1883.	Mean to in- clude 1882.	Departure + or -.	Mean for 1883.
Albany, N. Y.	72.5	+0.3	72.8	69.9	-0.9	69.2	69.2	0.2	51.3	51.3	0.0	50.9	50.9	0.0	44.0	44.0	0.0	31.0
Alpena, Mich.	66.0	-2.8	63.2	61.7	-3.3	57.0	57.0	-4.2	45.4	45.4	-1.6	42.7	42.7	-1.6	35.6	35.6	-0.4	23.2
Apache, Fort, Ariz.	72.3	-2.0	70.3	66.0	-0.7	65.3	65.3	+0.4	58.0	58.0	-2.4	56.6	56.6	-2.4	49.2	49.2	-2.9	38.9
Ashtabone, Fort, Mont.	67.4	+1.2	68.6	70.9	-0.5	70.9	70.9	-0.4	68.0	68.0	-2.4	66.6	66.6	-2.4	58.1	58.1	-2.7	48.9
Atlanta, Ga.	73.7	+1.1	73.6	73.1	-0.5	72.6	72.6	-0.5	67.8	67.8	+2.2	65.6	65.6	+2.2	58.9	58.9	-3.2	45.0
Atlantic City, N. J.	73.4	+0.6	72.2	70.5	-1.7	67.8	67.8	-2.2	57.1	57.1	-1.0	55.6	55.6	-1.0	44.0	44.0	-1.8	37.2
Augusta, Ga.	82.0	+1.4	73.5	72.9	-0.3	72.6	72.6	-1.1	64.1	64.1	+4.2	57.2	57.2	+4.2	47.1	47.1	+6.1	38.2
Baltimore, Md.	73.7	+0.6	71.8	70.4	-1.3	69.9	69.9	-1.2	57.7	57.7	+0.2	55.4	55.4	+0.2	44.4	44.4	+2.2	39.0
Barnegat City, N. J.	72.3	+1.2	70.5	69.6	-1.3	68.2	68.2	-2.3	54.8	54.8	+0.2	52.5	52.5	+0.2	40.9	40.9	+2.2	34.6
Bennett, Fort, Dak.	71.7	-0.3	68.3	70.2	+2.2	68.2	68.2	-2.3	44.9	44.9	-2.3	42.6	42.6	-2.3	35.7	35.7	-1.2	28.6
Benton, Fort, Mont.	68.5	-3.0	65.5	64.3	-1.2	63.2	63.2	-2.3	43.3	43.3	-2.3	41.0	41.0	-2.3	33.7	33.7	-0.6	24.3
Bismarck, Dak.	69.9	-3.0	66.9	67.3	-2.3	65.0	65.0	-1.9	44.9	44.9	-2.3	42.6	42.6	-2.3	35.7	35.7	-1.2	28.6
Block Island, R. I.	68.0	+0.3	68.3	67.3	-1.3	66.0	66.0	-1.3	44.9	44.9	-2.3	42.6	42.6	-2.3	35.7	35.7	-0.6	24.3
Bons City, Idaho.	73.0	+0.3	71.7	72.2	-1.3	69.7	69.7	-1.3	57.7	57.7	-2.3	55.4	55.4	-2.3	40.9	40.9	-1.1	33.0
Boston, Mass.	71.9	-0.3	69.7	69.6	-1.3	68.3	68.3	-1.3	44.9	44.9	-2.3	42.6	42.6	-2.3	35.7	35.7	-1.1	28.6
Brownsville, Tex.	84.0	-1.7	82.3	83.8	-0.3	82.5	82.5	-1.3	72.5	72.5	+3.0	69.2	69.2	+3.0	58.2	58.2	-1.1	47.2
Buffalo, N. Y.	70.2	-1.7	68.5	68.8	-0.3	68.5	68.5	-1.3	44.9	44.9	-2.3	42.6	42.6	-2.3	35.7	35.7	-1.1	28.6
Burton, Fort, Dak.	67.7	-2.9	64.8	64.3	-1.3	63.5	63.5	-1.3	44.9	44.9	-2.3	42.6	42.6	-2.3	35.7	35.7	-1.1	28.6
Carroll, N. Y.	77.7	-2.9	74.8	74.8	-2.2	72.6	72.6	-2.2	54.8	54.8	+0.2	52.5	52.5	+0.2	40.9	40.9	-1.1	33.0
Cape Henry, Va.	78.2	-0.7	77.5	76.5	-1.7	74.8	74.8	-1.9	59.0	59.0	-1.8	56.7	56.7	-1.8	44.9	44.9	-1.9	33.0
Cape May, N. J.	78.4	+0.1	78.3	77.6	-0.7	76.9	76.9	-1.0	59.0	59.0	-1.8	56.7	56.7	-1.8	44.9	44.9	-1.9	33.0
Cedar Key, Fla.	83.6	+1.6	80.9	80.9	-2.5	78.4	78.4	-2.5	68.2	68.2	+3.0	65.0	65.0	+3.0	54.0	54.0	-3.6	40.4
Charleston, S. C.	82.8	-0.9	80.9	79.9	-1.0	78.9	78.9	-1.0	68.2	68.2	+3.0	65.0	65.0	+3.0	54.0	54.0	-3.6	40.4
Charlotte, N. C.	78.3	+0.9	78.0	74.4	-1.6	71.8	71.8	-1.6	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Chattanooga, Tenn.	87.4	-0.9	85.5	83.3	-1.6	80.9	80.9	-1.6	68.2	68.2	+3.0	65.0	65.0	+3.0	54.0	54.0	-3.6	40.4
Chenango, N. Y.	74.0	+1.5	72.5	72.4	-0.9	69.5	69.5	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Chicago, Ill.	71.0	+0.3	70.7	70.4	-0.9	69.5	69.5	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Chillicothe, Va.	74.6	+1.8	73.0	72.1	-0.9	71.2	71.2	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Cincinnati, Ohio	73.5	+1.8	72.0	70.8	-0.9	69.5	69.5	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Cleveland, Ohio	70.7	-1.9	70.8	69.5	-0.9	68.0	68.0	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Columbus, Ohio	73.0	+1.9	73.1	69.5	-0.9	68.0	68.0	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Concho, Fort, Tex.	73.4	-1.2	72.2	71.8	-0.9	70.9	70.9	-0.9	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
Danbury, Conn.	75.4	-1.7	73.0	69.8	-1.4	64.2	64.2	-1.4	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3
David, Fort, Tex.	73.8	-1.7	72.1	72.0	-2.3	65.2	65.2	-2.3	54.8	54.8	+1.8	52.5	52.5	+1.8	40.9	40.9	-3.6	27.3

\* No record.

Table of comparative mean temperatures (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	July.			August.			September.			October.			November.			December.		
	Mean for 1883.	Mean to include 1882.	Departure + or -.	Mean for 1883.	Mean to include 1882.	Departure + or -.	Mean for 1883.	Mean to include 1882.	Departure + or -.	Mean for 1883.	Mean to include 1882.	Departure + or -.	Mean for 1883.	Mean to include 1882.	Departure + or -.	Mean for 1883.	Mean to include 1882.	Departure + or -.
Dayton, Wash. T.	67.4	67.4	+2.5	68.2	65.0	+3.2	59.9	58.8	+1.1	45.9	48.0	-2.1	34.7	33.6	+1.1	32.8	33.6	-0.8
Deadwood, Dak.	65.0	62.1	+2.9	62.6	62.6	-0.0	53.9	53.4	+0.5	40.1	40.1	0.0	34.2	32.5	+1.7	33.6	33.6	0.0
Delaware Breakwater, Del.	73.4	73.6	+0.2	71.7	72.5	-0.8	66.7	70.8	-4.1	58.2	58.2	0.0	46.3	46.3	0.0	39.6	39.6	0.0
Denver, Colo.	72.1	71.2	+0.9	71.2	72.5	-1.3	61.7	61.7	0.0	46.7	46.7	0.0	42.9	42.9	0.0	32.5	32.5	0.0
Des Moines, Iowa.	73.6	73.6	+0.0	71.2	72.5	-1.3	61.7	61.7	0.0	46.7	46.7	0.0	42.9	42.9	0.0	32.5	32.5	0.0
Detroit, Mich.	71.7	71.0	+0.7	69.7	70.5	-0.8	59.4	62.5	-3.1	50.8	50.8	0.0	41.8	41.8	0.0	27.3	27.3	0.0
Dodge City, Kans.	71.7	71.7	0.0	67.7	67.7	0.0	59.4	62.5	-3.1	50.8	50.8	0.0	41.8	41.8	0.0	27.3	27.3	0.0
Dubuque, Iowa.	71.7	71.7	0.0	67.7	67.7	0.0	59.4	62.5	-3.1	50.8	50.8	0.0	41.8	41.8	0.0	27.3	27.3	0.0
Duluth, Minn.	74.8	72.5	+2.3	68.5	68.5	0.0	58.8	62.5	-3.7	48.7	48.7	0.0	38.8	38.8	0.0	23.4	23.4	0.0
Eastport, Me.	66.8	66.0	+0.8	62.8	62.8	0.0	55.3	55.3	0.0	44.1	44.1	0.0	35.0	35.0	0.0	15.7	15.7	0.0
Elliot, Fort, Tex.	74.6	76.1	-1.5	73.8	73.8	0.0	66.1	66.1	0.0	55.2	55.2	0.0	43.8	43.8	0.0	23.4	23.4	0.0
El Paso, Tex.	80.6	80.6	0.0	77.4	77.4	0.0	70.7	70.7	0.0	61.1	61.1	0.0	50.2	50.2	0.0	33.3	33.3	0.0
Erie, Pa.	72.7	72.7	0.0	67.4	67.4	0.0	58.8	64.4	-5.6	43.8	43.8	0.0	38.8	38.8	0.0	23.4	23.4	0.0
Galveston, Tex.	67.0	68.3	-1.3	61.9	61.9	0.0	53.3	56.5	-3.2	45.1	45.1	0.0	38.8	38.8	0.0	23.4	23.4	0.0
Grand Haven, Mich.	68.9	68.9	0.0	64.6	64.6	0.0	57.0	60.9	-3.9	46.3	46.3	0.0	38.8	38.8	0.0	23.4	23.4	0.0
Grant, Fort, Ariz.	77.6	75.1	+2.5	73.8	73.8	0.0	71.7	70.8	+0.9	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Hattiesburg, N. C.	79.6	79.6	0.0	77.0	77.0	0.0	73.2	76.4	-3.2	68.3	68.3	0.0	64.9	64.9	0.0	56.1	56.1	0.0
Helena, Mont.	68.7	68.7	0.0	67.9	67.9	0.0	68.8	73.2	-4.4	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Huron, Dak.	68.7	68.7	0.0	67.9	67.9	0.0	68.8	73.2	-4.4	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Indianapolis, Ind.	76.8	76.8	0.0	70.4	70.4	0.0	68.2	68.2	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Indianapolis, Tex.	82.5	84.1	-1.6	83.6	83.6	0.0	78.2	78.2	0.0	73.2	73.2	0.0	64.9	64.9	0.0	56.1	56.1	0.0
Jacksonville, Fla.	84.1	84.1	0.0	80.8	80.8	0.0	78.2	78.2	0.0	73.2	73.2	0.0	64.9	64.9	0.0	56.1	56.1	0.0
Keokuk, Iowa.	77.7	77.7	0.0	75.9	75.9	0.0	72.6	72.6	0.0	68.3	68.3	0.0	64.9	64.9	0.0	56.1	56.1	0.0
Key West, Fla.	84.1	84.1	0.0	80.8	80.8	0.0	78.2	78.2	0.0	73.2	73.2	0.0	64.9	64.9	0.0	56.1	56.1	0.0
Kitty Hawk, N. C.	78.6	78.6	0.0	75.6	75.6	0.0	72.6	72.6	0.0	68.3	68.3	0.0	64.9	64.9	0.0	56.1	56.1	0.0
Knoxville, Tenn.	75.9	75.9	0.0	73.1	73.1	0.0	69.4	69.4	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
La Crosse, Wis.	72.4	72.4	0.0	68.1	68.1	0.0	63.4	63.4	0.0	58.8	58.8	0.0	50.2	50.2	0.0	38.8	38.8	0.0
Leavenworth, Kans.	76.8	76.8	0.0	72.6	72.6	0.0	68.1	68.1	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Lewiston, Idaho.	75.0	75.0	0.0	71.4	71.4	0.0	67.1	67.1	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Little Rock, Ark.	80.3	80.3	0.0	78.4	78.4	0.0	70.4	70.4	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Little Rock, Ark.	78.3	78.3	0.0	74.8	74.8	0.0	67.1	67.1	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Lynchburg, Va.	75.9	75.9	0.0	72.6	72.6	0.0	68.1	68.1	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0
Macon, Port, N. C.	75.9	75.9	0.0	72.6	72.6	0.0	68.1	68.1	0.0	64.9	64.9	0.0	56.1	56.1	0.0	49.3	49.3	0.0



# REPORT OF THE CHIEF SIGNAL OFFICER.

Stations.	July.			August.			September.			October.			November.			December.		
	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.	Mean to include 1882.	Mean for 1883.	Departure + or -.
Washington City.....	78.2	76.8	1.4	75.0	72.1	-2.9	67.8	65.1	-2.7	57.9	56.9	-1.0	43.8	47.2	+3.4	35.4	36.9	+1.5
Wilmington, N. C.....	80.5	81.5	-1.0	78.6	78.3	-0.3	73.4	72.1	-1.3	63.8	66.2	+2.2	53.7	57.0	+3.3	47.1	52.8	+5.7
Yankton, Dak.....	73.8	71.9	-1.9	72.7	70.6	-2.1	61.1	59.0	-2.1	49.0	46.0	-3.0	31.6	34.8	+3.2	20.9	24.1	+3.2
Yuma, Ariz.....	92.5	92.1	-0.4	91.1	91.0	-0.1	84.1	85.7	+1.6	72.8	66.7	-6.1	60.4	61.4	+1.0	56.0	(*)	(*)

\*No record.













## APPENDIX 35.

*Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at Signal Service stations, for each season of the year (computed from the commencement of observations to December 31, 1883).*

[The seasons comprise the following months: Spring: March, April, and May; Summer: June, July, and August; Autumn: September, October, and November; Winter: December, January, and February. The mean temperature is deduced from the three telegraphic observations, taken at the same moment of Washington time.]

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Albany, N. Y.	Dec. 22, 1873	45.6	70.5	51.1	26.5	8.69	11.95	9.26	8.18
Alexander, Fort, Alaska.	Aug. 1, 1881	(*)	(*)	(*)	(*)	5.55			8.82
Alpena, Mich.	Sept. 10, 1872	36.5	63.3	44.7	30.5	7.99	11.33	12.05	6.19
Apache, Fort, Ariz.	Oct. 9, 1877	50.9	69.8	52.1	35.8	2.36	10.78	4.67	4.49
Assinaboine, Fort, Mont.	Oct. 6, 1879	41.0	65.2	39.7	15.3	2.92	4.44	3.19	3.22
Atlanta, Ga.	Sept. 25, 1878	61.8	76.9	61.9	46.4	15.46	10.59	11.00	18.81
Atlantic City, N. J.	Dec. 10, 1873	47.3	70.4	56.1	33.8	9.90	11.54	10.00	16.71
Augusta, Ga.	Nov. 2, 1870	64.2	80.4	64.3	48.6	13.59	12.49	10.49	12.70
Baltimore, Md.	Jan. 1, 1871	53.2	76.0	56.9	36.2	9.98	12.46	10.35	9.21
Barnegat City, N. J.	Dec. 10, 1873	46.8	70.2	55.5	32.9	12.24	12.84	13.41	13.36
Behring's Island, Behring Sea	May 22, 1882	29.7	47.4		27.1	2.02	6.40		5.80
Bennett, Fort, Dak.	Dec. 22, 1879	42.7	70.2	44.5	16.8	6.14	7.03	2.44	2.07
Benton, Fort, Mont.	Oct. 11, 1879	42.3	67.1	42.2	18.1	4.00	4.54	2.81	2.63
Bismarck, Dak.	Sept. 15, 1874	39.0	67.0	41.2	10.9	7.46	8.56	3.38	1.88
Block Island, R. I.	Sept. 1, 1880	43.4	66.8	54.9	33.0	12.36	11.21	13.37	15.63
Boise City, Idaho	July 1, 1877	49.6	70.3	48.5	31.7	3.56	0.76	2.84	6.18
Boston, Mass.	Nov. 1, 1870	44.9	69.1	51.1	28.1	12.46	11.85	12.73	11.11
Brownsville, Tex.	Aug. 25, 1875	74.5	83.7	73.6	60.5	4.68	9.74	11.29	6.38
Buffalo, N. Y.	Nov. 1, 1870	42.0	68.0	50.0	26.4	8.23	9.53	10.66	8.50
Buford, Fort, Dak.	Oct. 23, 1878	39.0	65.7	40.0	9.1	4.41	6.78	2.36	2.78
Calro, Ill.	June 1, 1871	58.1	77.7	58.2	33.3	12.81	11.86	9.95	12.29
Cape Henry, Va.	Dec. 15, 1873	55.1	76.0	62.2	42.3	15.23	15.29	14.43	13.14
Cape May, N. J.	May 24, 1871	49.0	71.7	57.6	25.6	11.10	12.95	11.72	11.99
Cape Mendocino, Cal.	July 27, 1882	48.8	53.6	53.6	46.0	6.26	0.02	5.05	8.02
Cedar Keys, Fla.	Nov. 7, 1879	70.2	82.0	72.4	60.2	9.12	24.92	12.66	11.62
Charleston, S. C.	Jan. 5, 1871	64.9	81.2	66.7	50.9	14.20	19.69	14.95	11.13
Charlotte, N. C.	Oct. 6, 1878	59.5	77.7	61.2	43.4	12.09	13.69	10.62	15.67
Chattanooga, Tenn.	Jan. 8, 1879	60.1	76.6	61.0	44.4	16.00	11.29	12.87	19.75
Cheyenne, Wyo.	Nov. 1, 1870	41.8	64.7	44.1	26.9	2.65	4.63	1.90	5.50
Chicago, Ill.	Nov. 1, 1870	46.0	70.0	51.4	27.8	10.48	11.07	9.64	6.43
Chinoteague, Va.	Mar. 16, 1880	50.1	72.4	59.6	36.6	8.13	10.89	9.75	12.45
Cincinnati, Ohio.	Nov. 1, 1870	54.6	76.1	56.6	36.3	10.70	12.68	8.76	11.09
Cleveland, Ohio.	Nov. 1, 1870	45.8	70.0	51.9	28.3	8.23	11.95	9.68	7.96
Coleman City, Tex.	July 1, 1877	64.2	80.0	61.4	44.3	7.06	9.38	8.97	4.80
Columbus, Ohio.	July 1, 1878	51.2	73.0	54.4	32.3	11.43	12.08	9.87	11.14
Concho, Fort, Tex.	Oct. 10, 1875	65.8	80.6	63.0	46.0	6.00	10.51	8.33	3.62
Custer, Fort, Mont.	May 5, 1878	44.2	68.4	44.6	20.8	5.29	4.40	2.30	2.29
Davenport, Iowa.	Dec. 24, 1871	48.6	73.1	51.1	25.7	10.05	12.61	8.14	4.95
Davis, Fort, Tex.	Dec. 24, 1877	61.5	73.5	58.2	45.8	2.20	11.99	4.35	1.18
Dayton, Wash. T.	July 1, 1879	48.8	65.5	47.8	31.6	7.22	2.14	5.96	13.24
Deadwood, Dak.	Dec. 25, 1877	40.5	63.5	42.2	23.4	13.21	8.45	3.12	3.49
Delaware Breakwater, Del.	Jan. 28, 1880	49.5	71.4	59.3	36.0	6.64	9.00	7.95	8.97
Denver, Colo.	Nov. 19, 1871	47.6	69.8	49.3	29.9	5.62	5.08	2.49	1.69
Des Moines, Iowa.	Aug. 1, 1878	48.7	72.3	51.1	23.8	10.52	16.36	10.25	4.30
Detroit, Mich.	Nov. 1, 1870	45.1	69.7	50.5	26.7	8.96	11.02	8.10	7.34
Dodge City, Kans.	Sept. 15, 1874	52.9	75.3	53.5	36.6	6.28	8.91	3.13	1.49
Dubuque, Iowa.	July 10, 1873	47.5	71.9	49.5	23.6	9.15	14.45	10.49	4.57
Duluth, Minn.	Nov. 1, 1870	37.3	63.7	43.3	15.4	7.67	13.14	9.46	3.33
Eastport, Me.	Apr. 1, 1873	37.9	54.8	46.0	22.4	13.15	12.26	13.21	10.18
Elliot, Fort, Tex.	Nov. 29, 1879	55.2	74.2	54.6	34.0	6.41	8.01	6.03	0.81
El Paso, Tex.	Nov. 5, 1877	64.6	80.5	62.2	47.5	1.06	6.17	2.61	1.73

\* No record.

Mean temperature (in degrees Fahrenheit) and average precipitation, &amp;c.—Continued.

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Erie, Pa.	May 25, 1873	45.0	70.2	52.6	29.8	9.26	10.49	12.11	9.80
Escanaba, Mich.	May 24, 1871	35.9	64.2	44.1	17.6	7.57	12.51	10.40	4.14
Fort Smith, Ark.	June 1, 1882	58.4	77.8	62.8	37.8	11.18	7.44	12.72	10.07
Galveston, Tex.	Apr. 19, 1871	69.9	83.5	71.3	55.4	10.21	13.47	17.08	11.64
Grand Haven, Mich.	May 24, 1871	43.4	67.5	49.4	27.0	8.73	10.87	11.11	6.65
Grant, Fort, Ariz.	Nov. 1, 1875	50.2	76.0	60.5	44.6	1.59	8.63	2.62	2.69
Hatteras, N. C.	Dec. 1, 1880	56.6	77.2	66.3	45.4	18.12	17.46	20.81	18.27
Helena, Mont.	Oct. 15, 1879	42.4	65.2	42.1	20.0	2.89	8.09	4.25	3.87
Henrietta, Tex.	Feb. 1, 1877	63.6	81.7	63.8	41.6	7.30	9.48	5.29	3.32
Huron, Dak.	July 1, 1881	41.4	67.6	44.5	17.1	8.25	13.16	4.73	0.66
Indianapolis, Ind.	Feb. 10, 1871	52.4	74.5	53.8	32.1	11.97	14.65	9.95	9.99
Indianola, Tex.	May 1, 1872	70.4	82.9	71.4	55.7	7.20	9.29	12.25	7.52
Jacksonville, Fla.	Sept. 11, 1871	69.0	81.5	69.8	56.6	10.48	17.76	16.82	9.83
Keokuk, Iowa.	July 1, 1870	50.9	75.3	53.0	28.3	9.81	13.87	9.80	5.60
Key West, Fla.	Nov. 1, 1870	76.8	83.9	78.9	70.8	6.45	13.74	14.69	6.07
Kitty Hawk, N. C.	Jan. 15, 1875	55.4	76.3	63.0	43.6	14.90	19.58	16.52	15.26
Knoxville, Tenn.	Jan. 1, 1871	57.3	75.0	57.4	39.7	14.67	12.89	10.49	15.22
La Crosse, Wis.	Oct. 15, 1872	45.3	71.2	48.1	20.6	7.39	13.58	9.52	3.60
Leavenworth, Kans.	May 21, 1871	53.1	76.2	54.0	29.9	11.02	13.88	9.93	4.78
Lewiston, Idaho.	July 1, 1879	50.4	70.6	48.6	32.3	3.56	2.06	4.11	8.07
Little Rock, Ark.	July 1, 1879	62.6	79.0	62.7	45.9	17.41	11.11	11.97	16.01
Los Angeles, Cal.	July 1, 1877	58.4	67.6	62.7	53.5	4.28	0.02	1.57	8.96
Louisville, Ky.	Sept. 11, 1871	58.7	76.8	57.2	37.8	12.90	12.44	9.79	12.10
Lynchburg, Va.	May 24, 1871	56.1	76.5	57.5	38.7	10.26	10.78	9.98	9.74
Macinau City, Mich.	Aug. 20, 1882	32.7	61.1	47.1	19.2	6.69	9.88	9.14	12.10
Macon, Fort, N. C.	May 23, 1878	58.2	77.5	65.9	46.9	15.09	20.11	15.14	14.55
Maginnis, Fort, Mont.	July 14, 1882	38.1	62.1	40.7	19.6	3.58	1.71	3.58	2.92
Marquette, Mich.	May 1, 1871	37.0	63.2	44.4	19.8	5.92	10.74	11.23	4.07
Memphis, Tenn.	Feb. 28, 1871	61.4	79.5	60.6	42.8	17.47	11.33	11.58	14.89
Milwaukee, Wis.	Nov. 1, 1870	42.1	67.1	48.0	23.3	9.33	10.27	8.18	5.68
Mobile, Ala.	Nov. 7, 1870	67.2	81.4	67.6	52.6	18.34	19.53	13.71	14.14
Montgomery, Ala.	Nov. 9, 1870	65.3	80.8	65.2	50.4	17.24	11.40	9.25	15.78
Moorhead, Minn.	Jan. 1, 1881	36.0	65.8	39.9	6.5	5.55	12.12	7.54	3.04
Mount Washington, N. H.	Dec. 1, 1870	21.4	46.2	23.1	6.8	14.70	26.95	22.45	13.84
Nashville, Tenn.	Nov. 1, 1870	59.8	78.7	59.5	41.3	19.54	12.93	10.54	14.23
New Haven, Conn.	Dec. 10, 1872	46.5	70.5	52.8	29.6	12.32	13.67	12.15	11.76
New London, Conn.	Jan. 10, 1871	45.6	69.1	52.8	30.0	12.12	12.52	12.06	10.64
New Orleans, La.	Nov. 1, 1870	68.9	81.9	69.7	55.9	17.70	13.52	13.33	14.84
New York City	Nov. 1, 1870	47.6	71.6	54.5	31.5	10.06	12.40	10.86	9.66
Norfolk, Va.	Jan. 1, 1871	57.0	77.5	60.5	41.9	12.18	15.65	12.77	11.65
North Platte, Nebr.	Sept. 18, 1874	47.2	71.3	48.2	24.5	5.47	9.32	3.59	1.79
Olympia, Wash. T.	July 1, 1877	48.3	60.5	49.3	39.3	13.30	2.57	16.74	31.08
Omaha, Nebr.	Nov. 1, 1870	49.4	74.2	50.5	24.6	9.92	15.94	7.53	2.40
Ooglaasie (Point Barrow), Alaska.	Oct. 17, 1881	3.3	36.6	11.0	-19.2	1.18	3.19	2.73	1.06
Oswego, N. Y.	Nov. 1, 1870	43.2	68.2	50.9	27.5	8.09	9.37	9.26	9.17
Palestine, Tex.	Dec. 3, 1881	66.3	79.8	67.1	49.3	12.54	10.29	17.20	9.24
Pensacola, Fla.	Oct. 27, 1879	67.9	80.6	69.3	56.3	13.42	23.48	16.32	15.49
Philadelphia, Pa.	Jan. 1, 1871	50.5	73.9	55.3	33.2	9.21	13.09	9.97	8.78
Pike's Peak, Colo.	Nov. 1, 1873	14.3	37.2	21.2	4.1	9.87	11.41	5.73	4.39
Pittsburg, Pa.	Nov. 1, 1870	50.1	72.4	58.0	32.1	8.33	11.76	7.89	8.15
Poplar River, Mont.	May 1, 1882	(*)	(*)	(*)	(*)	3.54	1.86	2.68	1.37
Port Huron, Mich.	July 25, 1874	41.3	66.5	48.8	24.5	9.54	9.97	8.31	6.76
Portland, Me.	Jan. 15, 1871	43.6	67.2	49.7	26.3	8.95	10.40	10.67	9.04
Portland, Oreg.	Nov. 1, 1871	51.5	64.4	53.0	41.0	13.19	8.34	13.94	23.89
Prescott, Ariz.	Nov. 19, 1873	50.7	70.0	52.1	35.5	2.18	5.86	2.22	3.38
Provincetown, Mass.	Feb. 15, 1882	41.9	68.2	52.4	30.2	11.96	5.68	13.74	15.33
Red Bluff, Cal.	July 1, 1877	60.0	80.2	63.5	47.0	7.08	0.21	4.44	17.12
Rio Grande City, Tex.	May 23, 1875	78.1	85.0	73.8	60.5	4.57	8.41	5.56	8.33
Rochester, N. Y.	Nov. 1, 1870	43.4	68.8	49.6	25.8	9.36	9.73	8.63	9.13
Roseburg, Oreg.	July 15, 1877	51.1	64.2	51.6	41.5	8.89	1.83	7.93	17.78
Sacramento, Cal.	July 1, 1877	58.5	71.3	60.6	47.4	7.69	0.12	2.53	11.37
Saint Louis, Mo.	Nov. 1, 1870	54.8	76.8	55.9	34.1	10.25	11.74	8.12	7.51
Saint Michael's, Fort, Alaska.	June 28, 1874	20.0	...	...	...	1.85	...	...	1.87
Saint Paul, Minn.	Nov. 1, 1870	43.8	69.5	46.2	17.4	7.45	12.18	6.89	8.40
Saint Vincent, Minn.	Sept. 5, 1880	32.3	63.0	36.5	1.7	4.45	7.27	6.40	1.51
Salt Lake City, Utah.	Mar. 18, 1874	49.2	72.6	51.6	31.4	6.42	2.18	4.26	4.13
San Diego, Cal.	Nov. 1, 1871	58.1	66.7	62.7	54.4	1.91	0.30	1.24	6.06
Sandusky, Ohio.	Aug. 2, 1877	48.4	71.0	53.9	31.1	9.03	18.39	10.72	8.35
Sandy Hook, N. J.	Dec. 10, 1873	47.4	72.0	56.1	32.6	14.15	13.19	12.62	11.27
San Francisco, Cal.	Mar. 8, 1871	54.6	58.4	58.2	51.4	5.39	0.18	3.98	14.08
Savannah, Ga.	Jan. 1, 1871	66.5	81.3	66.8	52.7	11.93	19.29	11.69	10.07
Shaw, Fort, Mont.	Apr. 1, 1880	40.7	61.9	40.4	21.4	3.25	4.75	3.50	2.17

\* No record.

*Mean temperature (in degrees Fahrenheit) and average precipitation, &c.—Continued.*

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Shreveport, La.....	Sept. 3, 1871	66.2	81.9	65.0	49.0	15.46	9.41	13.18	14.72
Sill, Fort, Ind. T.....	June 23, 1875	61.5	79.4	60.7	39.3	8.82	11.14	6.88	5.17
Sitka, Alaska.....	Mar. 30, 1881	41.9	53.2	45.7	35.1	17.39	14.77	31.17	32.12
Smithville, N. C.....	Oct. 15, 1875	61.4	79.3	64.9	48.1	10.83	15.17	15.92	10.90
Spokane Falls, Wash. T.....	Feb. 5, 1881	46.8	66.1	45.3	27.0	4.32	2.29	6.26	9.35
Springfield, Ill.....	July 1, 1879	52.5	74.2	54.7	32.0	13.10	12.36	11.12	11.03
Stockton, Fort, Tex.....	Feb. 26, 1876	64.7	78.9	61.7	45.9	2.51	7.00	7.46	1.40
Thomas, Camp, Ariz.....	Sept. 22, 1877	60.9	80.6	59.3	43.2	1.59	4.89	1.16	2.13
Toledo, Ohio.....	Nov. 1, 1870	47.6	71.9	52.1	29.4	7.68	10.56	8.32	6.56
Unalakshka, Alaska.....	Aug. 18, 1878	35.5	48.7	39.7	31.4	14.62	7.25	26.42	21.84
Verde, Fort, Ariz.....	Nov. 9, 1874	60.7	80.0	60.4	42.3	1.06	5.57	2.52	2.58
Vicksburg, Miss.....	Sept. 10, 1871	66.0	80.8	65.3	50.4	19.13	11.38	12.82	15.42
Washington City.....	Nov. 1, 1870	53.0	75.5	56.5	34.9	10.09	12.28	10.26	8.93
West Las Animas, Colo.....	Oct. 1, 1881	49.7	72.4	50.5	25.7	4.36	5.01	1.26	0.49
Wilmington, N. C.....	Jan. 1, 1871	61.9	78.7	63.7	47.8	11.92	20.09	14.48	11.12
Yankton, Dak.....	Apr. 1, 1872	44.8	71.5	47.2	19.2	8.96	12.11	5.12	2.14
Yuma, Ariz.....	Nov. 18, 1873	70.5	89.9	72.3	56.2	0.18	0.48	0.16	1.26



## APPENDIX 36.

Maximum and minimum temperatures and annual range of temperature (in degrees Fahrenheit)

(Obtained from air)

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Albany, N. Y.	94	52.8	87.5	49.3	80	41.7	77	32.6	67.5	22	55	8.5
Alpena, Mich.	84	45	87	40	73	29.3	74	26.3	57	2.3	52	4.3
Apache Fort, Ariz.	97	51	92	50	96	37	79	22.7	72	16	61.5	15
Apache Pass, Ariz.					(1)		84.9	34.7	77.2	31.5	68.5	25.5
Ashland, Oreg.												
Assinaboine, Fort, Mont.	93	42	80	38	83	28	62	22	62	23	51	17
Atka, Alaska	72	38	68	40	60	35	53	31	57	22	41	18
Atlanta, Ga.	95	63.5	91.2	60	90	52	86	44	78.6	30	65	21.8
Atlantic City, N. J.	94	57	91	55	80	45	75	39.8	63	18.7	57.6	11
Augusta, Ga.	100	71.7	96	63	94.5	55.5	92	49	82.5	28	74	26.8
Baltimore, Md.	96	62	92	59	81	46	82.5	40.5	71	23	60	17
Barnegat City, N. J.	91	59.5	88	48	77	48	74	40.2	63	24	57	11
Bennett, Fort, Dak.	99.5	47	98	42	95	27	83	30	68	4	56	19
Benton, Fort, Mont.	94	44	92	37	84	30	67	21	61	23	60	10
Bidwell, Fort, Cal.												
Bismarck, Dak.	92	43	92	42	92	18.5	73	30	60	14	54	24
Block Island, R. I.	82	55	81	56	75.5	41.5	71	39	63.5	22.8	58	1
Boise City, Idaho	(4)	(4)	105	49	94.2	35.5	73	36	58	19.3	(4)	(4)
Boston, Mass.	96	51	91.8	48	79	41	80.4	29.4	68.8	14	58	12
Brownsville, Tex.	98	69	101	70	96	57	92	56	88.6	46	80	30
Buffalo, N. Y.	79.7	51.7	83.5	47	80.5	35.6	77.8	29.8	66	17.4	57.6	6
Burford, Fort, Dak.	96	40	96	36	91	18	74	14	52.3	19.2	44.8	34
Cairo, Ill.	92	60	92.5	61	89	47	85	36.5	73.5	15.3	71	13.8
Cambay, Fort, Wash.				(7)	86.4	48.5	60.2	40.2	56.8	32.5	57	28.6
Cantonment, Ind. T.												(1)
Cape Henry, Va.	96	65	92	62	85.5	59	89	48	81	26	68.7	21
Cape May, N. J.	89	59	86	57	80	44.5	74	38	64	22	57	14
Cape Mendocino, Cal.	69	45	68	46	80	46	64.5	43	72	38	71	46
Cedar Keys, Fla.	92.5	69.4	96	72.2	90.3	65.5	87.5	59	80.2	43.3	75.4	36.2
Charleston, S. C.	101	71	96	65	90	58	93	53	80	30	75	29.3
Charlotte, N. C.	97.5	64.5	94	60.2	91.8	51	85	46	78.2	19.6	66.6	22.6
Chattanooga, Tenn.	97	62	93	60.5	91	51	83	44	76	17	66	22
Cheyenne, Wyo.	94.2	40.9	90.2	36.2	82.2	30	73.4	6.8	66.1	16.2	60.2	16.5
Chicago, Ill.	91	50.9	89	54.5	83.3	42	78.5	38	62	10	57	6.5
Chinoctee, Va.	92	68	90	61	82	52	83	44	72	24	63	21.5
Cincinnati, Ohio	94	60.5	91.5	58	88	46	82	39.6	74.1	18.6	64	18.6
Cleveland, Ohio	92	49.6	92.5	47.8	86.7	38.5	82.8	33.5	70.5	14.6	60.6	11.3
Coeur d'Alene, Ft., Idaho	95	40	96	39	83	30	71	25	59	14	50	18
Columbus, Ohio	94	54	93	50	88	39	84	35	71.5	12	50	12.4
Concho, Fort, Tex.	101.8	66	103.4	61	96.6	46.8	93.4	37.5	82.3	26.5	77	23
Craig, Fort, N. Mex.												(1)
Custer, Fort, Mont.	101	41	101	36	95	31	78	20	68	10	56	13
Davenport, Iowa	92	52	88.2	49	83.7	38	82.2	31	62.2	6	50	2
Davis, Fort, Tex.	97	58	97	53	94	37	87	37	81.6	25.1	75	12
Dayton, Wash. T.	98	42	99.5	36	91	30	66	22	66	21.2	55.6	7.5
Deadwood, Dak.	89	42	87	42	84	31	71	22.2	65.7	6.7	58.7	8
Delaware Brkwater, Del.	89	62	87	64	79	53	79	45.5	70	25	61	19.3
Denver, Colo.	95.5	52	91	50	87.7	40	75.2	25	73.2	36.4	63	3
Des Moines, Iowa	97	54	91	48	90	87	80	28	67	6	57	10.2
Detroit, Mich.	91	50	89	48.6	81	29.8	78	34.4	67	14	58	11
Dodge City, Kans.	99	56	92	53	97	39.5	90	26	73	14	67	2
Dubuque, Iowa	96	50.8	91.8	48.3	84	34.5	84.8	31.3	62	7.2	57.7	5.6
Duluth, Minn.	99	47	85.7	48	79	30	64	21	54	8	51	62
Eastport, Me.	76	47.5	81.6	48	75	40	63.4	29.3	57.7	11.8	46.6	17
Elliott, Fort, Tex.	96	54	85	58	10	40	86	27.5	77	20	72	6.5
El Paso, Tex.	110	62	102	58	99	45	90	23.8	90.1	38.2	73.6	12.4
Erie, Pa.	88	52	82	50	84	42	82	36	68	19	57	10
Escanaba, Mich.	80	45	80	40	73	26	64.5	27.8	55	1.5	45	9
Fort Smith, Ark.	99.6	64	100.3	60.8	98.1	39.6	94	39.3	78.4	25	78.1	29.6
Galveston, Tex.	94	74	95	75	90	63.5	87	64.5	81	43	75	41
Grand Haven, Mich.	81	52.5	81	45.2	78.5	37.3	73	29.3	60.7	15.2	65	10.4
Grant, Fort, Ariz.	95.4	61.3	91.2	61.2	91.7	51	83.3	36.4	67.3	28.3	66	23.4
Hatteras, N. C.	90	67.5	92	67	85.4	63	82	52	77	33	66	38.3

1 Station opened.

25 days only.

19 days only.

\* Record incomplete.

\* 7 days only.

## APPENDIX 36.

at stations of the Signal Service, United States Army, July, 1883, to June, 1884, inclusive.  
[registering thermometer.]

1884.													Annual range.
January.		February.		March.		April.		May.		June.			
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
o	o	o	o	o	o	o	o	o	o	o	o	o	
50	-4	50.6	8.6	55.7	10	71.2	30	85.2	88.8	91.5	50.7	102.5	
40.5	-20	38	-17	54	-19	65	20.5	80.3	80.2	85	40	107.0	
30.8	6	69.2	8.2	66.2	15.3	77	24.8	85.3	81	96.3	38.1	91.0	
67.5	1	68.7	18.5	72.5	32	85	25	89	84	108	51.5	.....	
.....	( <sup>1</sup> )	70	4	( <sup>1</sup> )	20	( <sup>1</sup> )	26	93	83	91	60	.....	
42	-30	41.8	-35	59.6	-25.8	72.8	15.7	86.1	82	98.6	46.5	133.6	
45	20	46	20	44	22	50	21	.....	.....	.....	.....	.....	
64	-1.3	73	11	76.5	24.5	82.3	35	85	86	89	57	96.3	
50	4	54.6	11	60.2	8	67	29.5	78.1	41	87.2	49	90.0	
68	14	78	24	82	27.5	87.8	40	90	84.5	92	57.5	86.0	
52	8	68.2	10.6	64.5	14	70.7	34	89	89	92.6	52.3	84.0	
52	7	56.8	12	63	11.3	61.9	32.3	81.2	82.4	87.8	48.1	84.0	
49	-31	50.2	-32.5	70.9	-11	74	19	86	81.8	97.3	43.5	132.0	
47	-24	51.5	-35	57.1	12.2	74.2	18.1	88.5	30	100.2	44.1	135.2	
51	12	67	-21	60	15	74.8	25.6	86	89	93.5	36.2	.....	
42	-40	44	29	58.5	-14.4	69.8	17.0	80.1	29.1	92	43.7	132.6	
54	8	54	10.5	55.3	10	59.5	30.3	72.2	39.5	82.6	46.2	83.6	
61.5	2	57	-8.5	58.9	28.8	71.5	36.2	83	85.4	94.8	48	.....	
52.2	-0.5	59	3	60.5	4.5	69	27	87.5	85	92.6	42	108.0	
80	24.8	84.6	33	92.3	35.6	95.2	47	92	57.8	94.3	67.3	76.2	
45.7	-12.5	55	-7.4	60.9	-2	71.8	26.2	76.9	35.8	85.1	47.9	98.6	
46	-41	45	-40	58.8	-22.7	76.2	11.8	85.5	25.2	98.9	43.8	139.9	
65.5	-16	69	12	71	19	80	37.7	82.5	49	92	56	108.5	
55	32.3	68	16	64.2	33.5	78.2	40.9	76	42.6	68	47.6	.....	
( <sup>1</sup> )	-4.8	74	-0.7	78.9	14.2	86	31.4	90.1	86	92.8	56.3	.....	
69	12	74	19	76	22	79	38	92	47.1	89.8	51.4	84.0	
50.5	11	54	13	54.5	13	63.5	32	80	43	86	49	78.0	
61.5	36.5	68.5	28.5	63.5	36	63.1	38.3	60.5	42.1	64.9	46.6	61.5	
68.9	25.2	77.4	37.2	78.9	42.2	84.8	50.7	90	60.5	91	62	70.8	
70	13	76	27.5	81.2	34	86.4	43.5	91.3	60.5	89.1	58.2	88.0	
62.8	5	75	17.8	75	23	81.8	38.4	88.5	46.6	91	51.5	92.5	
62	-1	70	11	78	22.8	84.5	34.5	89	51.6	91.5	55.4	98.0	
50.2	-11	50.1	-28.2	88.9	1.5	69.9	18.3	79.8	23	93.4	43.2	122.4	
49.3	-18.5	53	-2.8	59.2	-0.9	77.2	31	78	40	86.4	47	109.5	
54.8	8	58.6	18	61.2	15	72.2	34.6	84.5	46.2	88.6	50.1	84.0	
58.7	-9.7	66.9	6.4	71.8	13.9	80	31.7	85	43.6	93.1	58.8	103.7	
51.8	-13	64.2	-3.5	64.8	-1.5	75.9	27	83.8	88	84	51.1	105.5	
50	-2	60	-20	80	Zero.	78	22	85	23	89	40	116.0	
48.5	-30.3	62.5	Zero.	66.9	6	77	30	85.5	39	92	55	114.3	
72	4	79.5	17.3	85.7	27	88.4	33.3	95.5	45.9	99.7	54.3	99.4	
61.6	7.8	70.5	9	72	20	84.5	30	92.6	80	104	54.9	.....	
40	-17	47	-81	60	-13	74	18.5	84	24.5	94.8	46	132.0	
47.2	-27	47.7	-4	65	-8	78.7	24	79.7	38	88.2	43.7	119.0	
73.1	6	76.2	20	77.1	30.1	80.1	27	87.9	40	97	52	91.0	
57.1	-1.5	58	-21.5	63.9	21.2	77.9	32.5	87.3	35.5	97.5	88	121.0	
53	-14.5	56	-26.8	52	-7.2	62	13	71.5	28	91	43	117.8	
53	9	63.5	15	62.4	15.3	70	35	81.3	45.5	84.1	52.3	80.0	
50	-2	61.3	-15	61.1	10.9	70.3	22.5	80.5	28	90.2	48	110.5	
48.7	-30.4	53.9	-8.2	70.1	-5.6	73.9	25.8	80.1	34.6	94.7	47.2	127.4	
51.5	-6	64.3	-5.8	62	3	70.5	30.1	81.1	35.9	90	48	97.0	
66.5	-11	65	-5	76	6	80	26	87	32	92.5	52	110.0	
44	-23.8	41.7	-7.5	65.2	-3.8	81	27	81	38.7	90.2	46.7	119.8	
44.9	-31	30.2	-19.4	53.8	-16.9	59.7	24.8	79.5	33.2	85.1	39.8	130.0	
45	-8	45	4.5	48	-0.6	57	23	72.8	34.2	82	39.3	99.0	
72.2	11.8	74.2	1.5	80	16.5	86	28	89.6	86	93	53.2	.....	
48.5	-10	68	-7	64.3	-1	76	26.9	86.5	36.8	87.8	51.4	102.0	
38.2	-17.5	37.8	-29.3	52.8	-26.8	60	19	71.4	30.6	81	42.8	110.3	
68.6	-5	75.4	9.5	82.8	23.5	88	35.3	91.6	46	99.5	54	105.3	
70.5	22	75	28.5	77.8	41.2	81	48.4	84.4	59.7	90.6	66	73.0	
49	-8.5	61	-2	59.8	55.5	71.8	28.5	75	87	83.6	49	92.1	
50.4	18.8	72.7	20.3	66.2	30.2	77.7	32.4	86.7	38.6	99	58.1	80.2	
68	15	71	27	68.8	26	69.1	41.6	80.5	48.2	83.2	54.5	77.0	

\* 26 days only.

\* Observation began September 1, 1883.

\* 23 days only.

\* 18 days only.



*Maximum and minimum temperatures and annual range of temperature*

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Helena, Mont.	90	46	87	38	81	39	68	23	60	-14	52	-3.5
Hoonah, Alaska	79	40	72	41	63	36	56	25	49	15	44	7
Huron, Dak.	99.2	46	90.6	42.7	88	28.2	76.8	21.8	62.4	-4.3	57	-26.5
Indianapolis, Ind.	92	56.8	91	53	87	40.4	61	35	65	10	62	9
Indianola, Tex.	95.1	73.7	96	72.4	90	61.2	89.8	51.8	82.2	42.2	78.1	25.7
Jacksonville, Fla.	98	60.5	94.5	70.5	90.5	62.5	92	59	83	43	78	26.5
Keokuk, Iowa.	95.5	56	90	55	86.5	39	84	33	68	13	62	2
Key West, Fla.	94.2	72.7	94.7	74	92	71.5	91	71	85.5	67	81	57
Kitty Hawk, N. C.	99.5	64	90.5	63.9	87.5	59	88	49.9	78.2	29	67.5	23
Knoxville, Tenn.	96	58.2	94	53.2	92	47	83.9	40.8	76.2	14.1	63.0	19
La Crosse, Wis.	95	52	89	52	79	35	80	27	59.2	3	53	-10
Lake View, Oreg.							(1)	(1)	(1)	(1)	(1)	15
Leavenworth, Kans.	96.5	59	93	53	92	43	85	34	73	16	65	4
Lewiston, Idaho.	98.1	50.5	98	45.5	93.5	34	65	29.2	63.2	25.2	54	6
Linkville, Oreg.												(1)
Little Egg Harbor, N. J.	98	57.5	92	55	96	47.3	74.8	36	62.1	23	55.1	10.4
Little Rock, Ark.	94	64	98	62	95	48	90	45	79	26	74	28
Los Angeles, Cal.	90	52.5	98	50	103.5	53	83	43.5	84	42	80	37
Louisville, Ky.	95	61	94	58	92	44	85.9	41	75	16.3	67.5	15
Lynchburg, Va.	96.6	58.2	95	56	96.6	46	83	41.8	75.8	19	66	22.5
Mackinaw City, Mich.	80.2	46.8	83.2	42.8	74.2	34	60.1	24	59.8	8.4	51.5	2.3
Macon, Fort, N. C.	89.5	70.5	91	63	85	62	80	49.5	71	30.3	64.5	27
Maginnis, Fort, Mont.	87	43	90	30	84	30	62	14	60	-16	58	-14
Maricopa, Ariz.							(1)	(1)	85	81	71	29
Marquette, Mich.	94	40.3	88	34.7	82	28	66	24	54.8	1	53	-12
McDowell, Fort, Ariz.									(1)	(1)	75.7	22.7
Memphis, Tenn.	97	64	94	61.5	92	51	88	44	77.3	20	72	22.5
Milwaukee, Wis.	90	50	88	51	88	39	78	31	66.5	5	55.5	7
Mobile, Ala.	101	71	99.4	68	94.5	67	91	46.3	80.5	33.4	74.6	25.5
Montgomery, Ala.	98.6	69.2	96.6	65	96	53	95	43.3	82.3	29	72.5	26.9
Moorhead, Minn.	91.5	43	87	39	87	17	64	15	55	-14	55	-34
Mount Washington, N. H.	60.5	27	58.3	20.4	66	14.8	54.5	6	46	-17.2	37.2	-41
Narragansett Pier, R. I.	87	56	85	45	77	29	75	29	62	17	56	25
Nashville, Tenn.	93.6	61.1	92.3	54.7	90.2	50.6	85.7	44.6	75.2	16.5	70.4	26.5
Neah Bay, Wash.									(1)	(1)	52	25
New Haven, Conn.	91	52	85	48	79	38	79	28	62.8	17.5	52.4	-7.5
New London, Conn.	89	53	84	49	78	41	70.2	27.2	63.2	17	56	7
New Orleans, La.	94.1	74.5	92.5	73.9	90.5	63	88.7	49.8	81	36.6	76	37
New River Inlet, N. C.	94	66	(*)	(*)	93	46.8	98	48	77.2	34	71.3	13.5
New York City	90.5	58	87	59	81	46.5	81	36	66	8	64	4
Norfolk, Va.	98.2	64.5	94.5	61.6	85	55.8	86.6	47.1	78.2	27.5	68.9	24
North Platte, Nebr.	95.3	54	92.3	48	91.3	36	83.8	29	67	13	59	5.5
Ocean City, Md.	(*)	(*)	85	57	80.5	50	(*)	(*)	102	102	85	24
Olympia, Wash. T.	90	41	78	46	77	38	64	33	57	29	54	24
Omaha, Nebr.	99	55	91.1	52.1	88.9	41	81.2	25.8	65.3	7	58	6
Oswego, N. Y.	92	52	97.5	52.3	81	40.2	89	31.8	70	19.6	55	25.5
Palestine, Tex.	97.5	71	97	65	95.5	49	94	41	82.5	34.5	74.2	28.9
Pensacola, Fla.	93.8	72.4	92.5	69.5	92.4	59.7	83.5	48.7	80	35.5	74.2	28.9
Philadelphia, Pa.	94	56	90	57.5	82.5	44.8	81.5	37.5	72.8	25	57.9	10
Phoenix, Ariz.	112	85	111.6	108	114	7	94.2	39.6	89.8	25.9	87.3	28.1
Pike's Peak, Colo.	97	29	93	31	49	7	33	5	81	-13	26	-32
Pittsburg, Pa.	95	53.5	94	51.5	93	39.4	85.5	33.5	73	15.3	64	15
Point Judith, R. I.	84	52	82	49	76	41	68	30.2	60	18.2	56	8
Poplar River, Mont.			(12)	(12)	490	28	(1)	(1)	60	25	41	36
Port Angeles, Wash.									(1)	(1)	7	18.5
Port Huron, Mich.	87	48.9	89.5	48	83	35.5	79	30	64.5	8.5	55.5	1.5
Portland, Me.	89	53	87	48.5	78.5	43	79	29	62	17	52	-8.1
Portland, Oreg.	94	48	80	43.5	87	44.6	64.2	37	60	33.5	54.4	24.2
Prescott, Ariz.	94.8	53.5	93.5	52	95	36.5	75.5	23	78	18.5	68.8	13.5
Provincetown, Mass.	93	53	90.5	53	77.5	45.5	78	34.1	63	22.6	59	-8.1
Pyramid Harbor, Alaska	71	43	74	40	69	32					43	4
Pysh, Wash.									(1)	(1)	7	23
Red Bluff, Cal.	107	58	101	56	103	53	79	40	75	30	71	25
Reno, Fort, Ind. T.	98	57	98	57	98	40	88	28	63	17	44	13
Rio Grande City, Tex.	104	63	105	68	104	53	90.6	50.3	92.7	44.1	83.5	35
Rochester, N. Y.					(17)	79	37	60	16.5	55.5	57.5	25.5
Roseburg, Oreg.	93	46.4	86.4	45.2	86.2	39.4	65.2	32	58.8	37.4	57.5	25.5
Sacramento, Cal.	103.5	56	100	54.8	101	53.9	81	42.2	71	29	67	24
Saint Louis, Mo.	96.5	59	97	58.2	92	43.3	86	34.6	72	17.5	61.5	8.5
St. Michael's, Ft., Alaska	65.5	36	68.6	37	66.5	30	45.1	12	33.5	-17	28.5	-26

1 Station opened.

2 No record.

3 Record incomplete.

4 23 days only.

5 27 days only.

6 20 days only.

7 22 days only.

8 26 days only.

9 24 days only.

10 17 days only.

11 16 days only.

**REPORT OF THE CHIEF SIGNAL OFFICER.**  
(in degrees Fahrenheit) at stations of the Signal Service, &c.—Continued.

1884.

January.		February.		March.		April.		May.		June.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
51.2	47.2	52	—20	51	—9	63	26	76	31.5	86	43.5
47.2	44.2	47	—14	50	15	62	22	60	32	68	39
44.2	41.2	44.3	—31.5	49.5	—14.6	72	21.7	83	30.3	93.9	42.9
41.2	38.2	44.2	—1.6	69.5	5	80.5	34.4	84	40.6	92.8	54.7
38.2	35.2	65.2	—28	78.5	33.2	87.4	41.1	88.2	56	93	67.9
35.2	32.2	79	—38.8	85.2	42.4	88.5	47.2	90.7	62.3	91.6	61.7
32.2	29.2	79	—38.8	66.5	2.5	80.4	28.2	80.2	40	91	51
29.2	26.2	51.8	—60.2	85.9	58	88.8	65.8	90.7	70.8	91.9	72.5
26.2	23.2	83	—31.1	71	21.5	73	38	89	42.5	91	52
23.2	20.2	71.1	—7.5	75.7	14	86	30.7	89	45.8	92.1	53.1
20.2	17.2	74.3	—10	66	—10	75	27.5	79.3	38	88	51.4
17.2	14.2	48.5	—22	450	15	63	19.5	( <sup>1</sup> )	( <sup>1</sup> )	81.5	33
14.2	11.2	57	—1	70	11	75.8	29	84	39	90.8	52
11.2	8.2	55.2	—17.8	62.2	23.8	77	34.8	92	39	95.6	48.7
8.2	5.2	52	—27	758	15	69	10	90	24	86	35
5.2	2.2	53.1	—13.5	60.2	10.8	65.6	30.5	90.8	41.4	86.1	46
2.2	—0.8	76	—17	78	28	85	35.7	87.3	53.5	95	62.8
—0.8	—3.8	81	—38.5	72.5	37	80	41.5	79	47	96	49.5
—3.8	—6.8	70	—11.2	75	13.5	88.1	37.1	89	46	95.2	58.3
—6.8	—9.8	69	—16.6	72	16	83.2	33.3	90.6	45	91.5	50.5
—9.8	—12.8	39	—24.3	52.2	—30.2	68.1	19.1	73	33	81.4	43.5
—12.8	—15.8	66.2	—28.2	70.7	25.6	74.3	40.7	79.2	53.4	83.4	55.1
—15.8	—18.8	51.1	—26	53.1	—14.1	65.8	16.9	78.4	29.6	87.6	43.4
—18.8	—21.8	81	—26	74	35	93	39	104	49	114	55
—21.8	—24.8	81	—23.7	56	—16	69	17.9	72.5	31	91	37.4
—24.8	—27.8	38.8	—18.5	79.8	36.5	92.6	37.5	102.2	43.5	113	50
—27.8	—30.8	85.3	—23	75	26.8	83	40.5	86.8	54	96	59
—30.8	—33.8	72.7	—13.3	58.1	—8.5	78.8	27.8	79.4	35.1	84.5	44.3
—33.8	—36.8	45	—26	83.9	37	85.9	43	92.7	58.7	96	61.7
—36.8	—39.8	75.5	—22	82.8	32	85.3	42.6	93.1	59.4	94.1	50.8
—39.8	—42.8	80.9	—30	53	—23	67.5	17	85.5	28.5	91	39
—42.8	—45.8	37	—30.2	41.6	—26	45.2	1.8	55	12.5	67	26.5
—45.8	—48.8	39	—4	60	4	62	26	75	33	91	41
—48.8	—51.8	50	—9.8	76.2	19.4	81.5	34.1	87.6	48.4	92.2	58.3
—51.8	—54.8	71.9	—25	60	32	68	31	70	37	68	41
—54.8	—57.8	56	—0.7	58.2	0.8	66.1	29.2	85	32	92	41.4
—57.8	—60.8	52.8	—3	60	4	67	29	83	34.7	87.5	43
—60.8	—63.8	51.5	—32.7	80.5	40.9	82	50	86.2	61.7	90.9	68.5
—63.8	—66.8	77.1	—23	75	23.3	78.5	40.9	91.1	47.8	92.5	53
—66.8	—69.8	71	—2	68	5	73.5	32.1	84.7	42.4	92	49.1
—69.8	—72.8	61	—22.8	75	23.3	78.5	40.9	91.1	47.8	92.5	53
—72.8	—75.8	50	—14.8	65	—1	70.5	25	88	32	94	49
—75.8	—78.8	55	—12.1	40.2	13.8	72.9	27.2	85.7	42.4	93.2	( <sup>2</sup> )
—78.8	—81.8	55.1	—6.8	64	25	76	35	87	36	87	40
—81.8	—84.8	55.5	—17.6	67.3	—2.6	75	25.3	82.5	36	93.4	52.8
—84.8	—87.8	51.5	—29	56	7.5	78	29.2	83	37	90.2	49.8
—87.8	—90.8	74.3	—10.5	80	31.8	82.3	38.4	84.9	52.6	92	60.4
—90.8	—93.8	65	—19.1	82.7	37.5	83	44.7	86.9	60.3	91.6	64.1
—93.8	—96.8	87.5	—30	66	12	74	33	88	41.5	94.8	47.2
—96.8	—99.8	20	—3.2	79.3	30.1	96.5	33.1	104.5	36.3	114.1	48.5
—99.8	—102.8	70	—5	17	—20	23	—7	40.5	—3.1	43.5	19
—102.8	—105.8	47	—48.3	71.3	9.5	78.2	29.5	91.5	39	95	50.3
—105.8	—108.8	41.3	—3	58.2	5.7	59	21.2	70	33.8	77	42
—108.8	—111.8	51.3	—15.3	53.5	19.5	63.4	9.2	83.5	24.6	99.1	45
—111.8	—114.8	56.9	—7.7	59.8	—5.9	69	26.5	80.4	32	87	46.5
—114.8	—117.8	49	—7.2	58.7	2.9	68	29.3	82.7	39.2	89.4	44.3
—117.8	—120.8	64.7	—10	66.7	28.2	79.6	39.6	90	40.4	89	47
—120.8	—123.8	67.2	—0.3	63	20	71.2	18.3	82.5	30.2	92.5	37
—123.8	—126.8	48.3	—4	57	6.4	( <sup>14</sup> )	( <sup>14</sup> )				
—126.8	—129.8	46	—9	49	12	61	20	61	136	78	( <sup>14</sup> )
—129.8	—132.8	57.5	—22	55.5	18.5	69	31	70	35	71	37
—132.8	—135.8	79	—2	71.5	32.5	77	41.5	91	50.5	94.5	52
—135.8	—138.8	73	—33.2	79	17	85	31	90	37	96	55.4
—138.8	—141.8	92	—6	98.2	32	101.6	45	100.6	58	106.2	68
—141.8	—144.8	53.5	—3.3	56.8	—2	75.5	27.8	82.6	33.3	86.1	46.6
—144.8	—147.8	71	—21	68	28.2	78	35.2	88.2	35	84.3	42.7
—147.8	—150.8	63.5	—7.1	70.5	39	74.2	40	85	50.5	92	52.9
—150.8	—153.8	37	—26	69	10	83.3	34.1	86	44	95	52.5
—153.8	—156.8			43.5	—10	41.5	—10	52	11	60.5	31

Thermometric observations began Aug. 16, 1883.

19 days only.

Observations discontinued April 1, 1884.

<sup>14</sup> 18 days only.

<sup>16</sup> No record.

<sup>17</sup> Station reopened October 10, 1

*Maximum and minimum temperatures and annual range of temperature*

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Saint Paul, Minn.	100	52	88	46.5	84	30.5	75	25	60	6.5	53	-15.8
Saint Vincent, Minn.	93	40	82	39	89	17	69	11	57	-22	42	-40
Salt Lake City, Utah.	96	55	94	51.5	89	46.5	66	27.6	64.2	17.3	53	3.4
San Carlos Ag. cy, Wash.	107	54	106	60	108	49	86	30	79	23	60	27
San Diego, Cal.	80	50	84	50.9	101	50	80.5	47.8	82.2	43	78.2	42
Sandusky, Ohio.	(1)	(1)	91.8	55.3	83.5	45	85	38	60.5	15.2	57	14
Sandy Hook, N. J.	95	50	91	61	83	49	77	39	67	22	57	5.5
Sanford, Fla.	90.4	70	96.9	69	91	66.5	91.8	63	82.3	50.5	86.5	36
San Francisco, Cal.	80	50.5	82	52	91	53	74.5	48	67	43.5	62	28.5
Savannah, Ga.	90.5	72	95	65.5	90	61	91.5	53.2	81	30	74.7	28.5
Scott's Hill, N. C.	100*	53	96	60	91	53	90	47.8	81.1	24	70.5	21.5
Shaw, Fort, Mont.	94	38	90	33	83	27	60	5	60	-21	50	-9
Shreveport, La.	102	71	102	68.8	99	48.8	95	42	83	31	75.8	29
Sitka, Alaska.	67.5	43.7	64	42.5	60.4	40	50.8	26	52.8	5	52.8	11.8
Smithville, N. C.	92	70.5	92	58	86	57.5	84.2	46.4	74.1	30	66	24.8
Spokane Falls, Wash. T.	96.7	46	96.3	39	84	35	70.4	24	57.6	19.8	47	3.5
Spokane, Fort, Wash. T.						(*)	77	21	61	12	53	2
Springfield, Ill.	95	54	90	54.9	88	30.4	82.8	34.4	67.5	12.5	64	4.1
Stanton, Fort, N. Mex.												(*)
Stockton, Fort, Tex.	103	60	98	54	93	40	87	34	87	24	80	16
Sully, Fort, Dak.	(*)	51	(*)	50	99	28	81	22	70	3	(*)	-13
Tatoosh Island, Wash. T.						(*)	63.5	38	52.2	32.4	54.2	25.8
Thatcher's Island, Mass.	84.5	52	80.2	45.5	72	39.5	59	35.8	50	18.5	54.4	-5
Thomas, Camp, Ariz.	103	61.9	101	61.9	100	45.0	80.5	30	77	21.8	71	19.6
Toledo, Ohio.	93	50	91	52	82	37	83	34	68	13	38.2	16.2
Unalakha, Alaska.	72	40	69	38	60	33	61	30	54	19	45	14
Verde, Fort, Ariz.	103	60	101	63	103	46	86	30	75.5	22	66	24.5
Vicksburg, Miss.	96.5	67.6	96	65	95.2	54.3	93.4	43.6	82.4	28.3	77	29.8
Washington City	97.1	61.9	93.6	55.4	87	43.6	84	36.2	73	20.8	60.1	15.1
Wash Woods, N. C.	90.8	46	90.8	62	88.8	60	(*)	(*)	62.8	10	(*)	(*)
West Las Animas, Colo.	104	55.5	99.5	52	97.5	35	96.5	19	77	8	68	-2.5
Wickenburg, Ariz.	106.5	54	108	63	(*)	(*)	86.3	32	83.5	26	74	28
Willcox, Ariz.								(*)	81.0	11	80	10
Wilmington, N. C.	97	68.5	96.5	62	90.1	59	90	48	82	28	71.8	27
Yankton, Dak.	103	53	92	48	89.1	36.6	81.2	21.1	66.8	2.6	50.5	-12.9
Yates, Fort, Dak.	98	49	(*)	(*)	94	34	80	19	60	-15	62	-31
Yuma, Ariz.	110.9	74.5	110.7	74.3	110.8	63.4	90.5	41.4	87.5	37.1	(*)	(*)

\* Station reopened July 20, 1883.

\* 27 days only.

\* 24 days only.

\* 26 days only.

\* Station opened.

\* No record.

\* Observations began October 1, 1883.

(in degrees Fahrenheit) at stations of the Signal Service, &amp;c.—Continued.

1884.												Annual range.
January.		February.		March.		April.		May.		June.		
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
45	—31.5	45	—18	59.5	—12	71.5	21.9	81	34	90	47.5	131.5
36.3	—41	39	—37	33.2	—27	37.5	18	35.1	29.3	90.1	39	134.0
52.4	1.6	53.8	—13	57.8	23.8	70.2	34.3	83.7	35.7	91.8	47.7	109.0
64	17	79	24	74	33	86	34	99	38	110	49	93.0
77.5	38.7	79	37.8	67.9	43	68.8	44.8	72.2	47	81	50	63.2
52	—10.7	62	—2.8	64.5	6	72.9	30.1	86.9	42	88	53.2	89.5
50	8	62.5	6	63.6	6.9	67	34	86	45	91.2	51.3	70.9
81.5	23.5	83.5	40.4	88.5	43	91.5	49	94.7	63.2	94.8	62.6	56.0
58.5	43	71	35	68.5	45	68.5	45	80	49	71	52.5	81.0
68.5	18.5	76.5	26	83.5	34	96.7	45	90.5	58	91	58.5	95.1
69	4.9	77.5	34.5	80.8	20	85.5	32	84.5	49	84.9	47	123.0
51	—15	53	—32	55.3	—22.5	70.8	20.8	81	26.8	91.5	45	91.5
75	10.5	78.2	19.1	83	33.2	86.2	40.3	90.6	55.7	99	63	69.6
49.8	19	52.5	11	48.4	23.3	60.1	27.5	56.4	36.2	74.6	39	86.0
63.5	6	69	25.5	75	27.4	85.6	38.5	88.2	52.6	86	50.6	114.5
50.9	41.2	48.8	—17.8	58.2	12	73	31.5	83.8	37.8	98.8	42.8	117.3
51	3	47	—32	63	6	74	19	89	25	93	35	94.3
62.5	—22.3	55.1	5.6	66.5	7	80	32.2	78.1	41	90.8	50.9	46.0
65	—2	67.9	4	68.3	15	73	18.3	79.6	29.9	101.1	55.8	92.7
78.5	8.7	82	23	86.5	27	90.4	29.4	96.4	42	101.1	55.8	95.0
( <sup>1</sup> )	—33	( <sup>1</sup> )	—25	( <sup>1</sup> )	—19	( <sup>1</sup> )	20	( <sup>1</sup> )	31	( <sup>1</sup> )	46	97.7
55.7	32.9	52.1	20.6	53	25.3	61.2	40	63.8	42.7	64.2	46	95.0
47.5	3	48.3	3.5	54.2	4.5	61	33	69.2	37.5	87.7	41.5	107.0
64	10	74.2	18.8	73.5	26.8	84.5	31.8	95	36.9	105	47.4	58.0
53.8	—14	56.3	—0.5	63.5	3	70.6	29	82	36.5	91.5	52.5	91.5
49	16	43	24	59	16	59	15	53	31	68	36.5	86.9
68	15.5	71.5	15	68.5	27.5	85	30	96.5	38	106.5	42	86.9
73	10.3	79.5	23	79.6	35	84.8	44	87.8	57.3	97.2	62.2	95.4
52	1.7	76.2	9.2	67	13.1	82.1	32.1	91.8	42.1	96.7	49.9	126.7
62.8	97	1271.8	120	1273	121	1279	1239	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	47.5
68.2	—10.5	71.2	—22.7	79.3	9.2	79.2	22	90.4	27.5	97.7	47.5	126.7
73	21.5	80	21	72	30	87.5	33.5	97	40	111	45.5	84
30	2	89	6	76	12	84	13	98	15	108.2	34	88.0
71.4	9	75.4	28.8	77.7	29.7	84.2	41.3	88.6	51.2	89.7	51	131.0
49.6	—28	61.8	—23.1	65.3	—10.9	72.1	27.1	82.5	34.1	98.3	47.3	88.0
45	—45.5	46	—39	54.5	—14	70	17	82	35	95.5	40	58.4
71.7	36.6	84.2	34.1	81.3	42.6	95	45.1	104.2	48.9	112.2	58.4	

<sup>1</sup> 19 days only.<sup>2</sup> Record incomplete.<sup>3</sup> 21 days only.<sup>11</sup> 16 days only.<sup>12</sup> 23 days only.<sup>13</sup> 17 days only.

## APPENDIX 37.

Table showing the Highest and lowest temperatures (in degrees Fahrenheit) recorded at stations  
commencement of observations to

[From self-registering

Stations.	Established.	January.		February.		March.		April.		May.	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Albany, N. Y.	Dec. 22, 1873	50	-18	58	-18	64	-4	80	13	92	29
Alexander, Ft., Alaska.	Aug. 1, 1881	40	-18	87	-26	41	-6	48	8	61	23
Alpena, Mich.	Sept. 10, 1872	52	-27	58	-27	66	-14	76	-2	91	22
Apache, Fort, Ariz.	Oct. 9, 1877	67	6	74	9	83	11	89	15	93	29
Assinaboine, Fort, Mont.	Oct. 6, 1879	46	-48	56	-47	67	-13	81	7	79	20
Atka, Alaska.	May —, 1879	43	20	45	19	45	15	50	22	52	24
Atlanta, Ga.	Sept. 25, 1878	73	9	74.5	21	81	27	86	25	91	38.5
Atlantic City, N. J.	Dec. 10, 1873	64	8	71	5	72	10	79	19	89	33
Augusta, Ga.	Nov. 2, 1870	79	15	82	22	80.8	22	90	31	100	42
Baltimore, Md.	Jan. 1, 1871	71	6	78	2	76	5	84	23.5	95	34
Barnegat City, N. J.	Dec. 10, 1873	61	-10	70	4	73	10	79	19	91	34
Behring's Isl'd, B'g Sea	Dec. 22, 1882	*33	7.3	*38	11.8	*38.9	13.6	*38	10.9	*43.6	28.2
Bennett, Fort, Dak.	Dec. 22, 1870	55	-42	63	-34	78	-11	86	4	92	30
Benton, Fort, Mont.	Oct. 11, 1879	58	-55	62	-41	74	-42	81	6	98	26
Bismarck, Dak.	Sept. 15, 1874	49	-37	60	-31	72	-25	80	1	92	21
Block Island, R. I.	Sept. 1, 1880	56	-4	51.5	2	54	10	62	25	78.3	36
Boise City, Idaho	July 1, 1877	57	-27	64	-12	76	9	80	17.5	88	29
Boston, Mass.	Nov. 1, 1870	69.5	-13	64	-6.5	72	7.5	85	11	97	31
Brownsville, Tex.	Aug. 25, 1875	83	18	85	27	92	35	97	43	99	49
Buffalo, N. Y.	Nov. 1, 1870	65.5	6	63.8	-13	72	2	82.6	11	87	29
Buford, Ft., Dak.	Oct. 23, 1878	47	-46	57	-40	70	-23	92	7	95	22
Cairo, Ill.	June 1, 1871	70	-11	74	4	84	10	89	24	92	37
Cape Henry, Va.	Dec. 15, 1873	78	9	80	11	83	12	85	28	93	41
Cape May, N. J.	May 24, 1871	58	1	59	2	65	9	76	24	81	34
Cape Mendocino, Cal.	July 27, 1882	61.5	31	64.5	30.5	69	38	57	36	74	38
Cedar Keys, Fla.	Nov. 7, 1879	77	32	79	35	82	40	88	38	91	50
Charleston, S. C.	Jan. 5, 1871	80	23	78	26	85	28	87	32	94	47
Charlotte, N. C.	Oct. 6, 1878	70	11	76.5	22	79	26	85	28	94.4	40.5
Chattanooga, Tenn.	Jan. 8, 1879	73	13	74	16	82.5	28	88	28	93	41
Cheyenne, Wyo.	Nov. 1, 1870	63	-38	59	-28	77	-17	80	2	88	23
Chicago, Ill.	Nov. 1, 1870	65	-20	63	-13	73	-12	83	17	89	27
Chinoctague, Va.	Mar. 16, 1880	60	8	71	5	72.2	17	79	26	88	40
Cincinnati, Ohio	Nov. 1, 1870	69	-10	73	-1	77	1	85	18	94	35
Cleveland, Ohio	Nov. 1, 1870	70	-17	72	-11.2	76	-2	85	15	92	28.3
Columbus, Ohio	July 1, 1878	64	-20	72	-2	71	14	86	15	92	34
Concho, Fort, Tex.	Oct. 10, 1875	78	-1	87	6	97	16	98	29	107	46
Custer, Fort, Mont.	Dec. 5, 1878	60	-31	65	-38	76	-23	85	12	84	22
Davenport, Iowa.	May 24, 1871	60	-23	66.7	-16	74	6	81	16	90	29
Davis, Fort, Tex.	Dec. 24, 1877	77	Zero.	79	9	87	17	95	25	101	40
Dayton, Wash T.	July 1, 1879	61	-23.5	64	-24	83	8	91	21	90	30
Deadwood, Dak.	Nov. 1, 1878	62	-30	62	-32	73	5	82	11	84	21
Del. Breakwater, Del.	Jan. 28, 1880	56	10	66	7	73	19	79	25	89	40
Denver, Colo.	Nov. 19, 1871	67	-29	72	-23	81	-10	89	4	92	27
Des Moines, Iowa.	Aug. 1, 1878	63	-26	68	-23	80	3	89	11	93	33
Detroit, Mich.	Nov. 1, 1870	65	-15	60	-20	75	7	78.5	8	90.5	29
Dodge City, Kans.	Sept. 15, 1874	70	-20	78	-20	89	8	92	13	96	34
Dubuque, Iowa	July 10, 1873	62	-23.2	67.2	-31	75	-10	84	14	94	27
Duluth, Minn.	Nov. 1, 1870	51	-38	57	-34	62	-26	73	3	91	26
Eastport, Me.	Apr. 1, 1873	51	-20	47	-20	53	-4	68	2	80	29
Elliott, Fort, Tex.	Nov. 29, 1879	81	-12	78	-10	86	-2	96	30	94	38
El Paso, Tex.	Nov. 6, 1877	74	5	82	12	88	21	96	29	101	41
Erie, Pa.	May 25, 1873	73	-15*	70	-16	78	2	86	11	91	33
Escanaba, Mich.	May 24, 1871	45	-26	52	-32	57	-20	65	2	83	20
Fort Smith, Ark.	June 1, 1882	68.5	2.5	78.4	8	82.5	28	88.5	37.2	98.3	45
Galveston, Tex.	Apr. 19, 1871	75	20	75	30	85	34	85	44	91	64
Grand Haven, Mich.	May 24, 1871	57	-12	58	-24	71	Zero.	80	9	86	28
Grand, Fort, Ariz.	Nov. 1, 1875	77	10	80	17	87	21	93	29	94	37
Hatteras, N. C.	Dec. 1, 1880	64	-22	69	-20	69	32	75	61	88	47
Helena, Mont.	Oct. 15, 1879	50	-34	60	-32	66	-2	73	6	77	25
Hoonahshoo, Alaska.	July —, 1881	42	8	45	Zero.	51	Zero.	68	23	76	29
Huron, Dak.	July 1, 1881	45.5	-30.3	57.2	-81.8	74.8	-7.8	81.2	18.2	78.8	26
Indianapolis, Ind.	Feb. 10, 1871	69	-22	72	-8	77	9	85.3	19	89	31
Indianola, Tex.	May 1, 1872	80	15	80	21.5	90	32	91	32	95	61
Jacksonville, Fla.	Sept. 11, 1871	80	24	83	32	88	81	91	37	95.5	48
Keokuk, Iowa	July 16, 1871	64	-20	69	-11	80	-2	85	20	88	29
Key West, Fla.	Nov. 1, 1870	90	48	87	55	89	58	91	61	98.2	63

\* From exposed thermometer.

## APPENDIX 37.

of the Signal Service, United States Army, for each month of the year and including December, 1883).

June.		July.		August.		September.		October.		Nov.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
101.5	40.0	48.0	93.0	45.0	96.0	33.0	84.0	23.0	70.0	
101.5	35.0	45.0	92.0	40.0	92.0	29.3	83.0	22.0	63.0	
101.5	35.0	41.0	98.0	41.0	96.0	32.0	83.0	19.0	77.0	
101.5	35.0	35.0	98.0	37.0	86.0	28.0	76.0	16.0	62.0	
101.5	35.0	35.0	68.0	39.0	62.0	35.0	54.0	28.0	57.0	
101.5	35.0	57.8	96.2	57.0	90.5	44.0	86.0	35.0	80.0	
101.5	35.0	53.0	91.8	53.0	94.0	43.0	83.0	29.0	72.0	
101.5	35.0	62.0	98.0	52.0	97.0	48.0	92.0	29.0	84.0	
101.5	35.0	59.0	95.0	53.0	96.0	40.0	89.0	30.0	78.0	
101.5	35.0	53.0	63.6	39.5	101.0	40.0	82.5	28.0	73.0	
101.5	35.0	36.1	104.0	42.0	58.5	31.3	49.1	19.2	42.0	
101.5	35.0	46.0	108.0	34.0	95.0	14.0	87.0	6.0	70.0	
101.5	35.0	37.0	105.0	39.0	94.0	10.0	88.0	6.0	67.0	
101.5	35.0	43.0	82.0	55.0	86.5	41.5	75.4	35.0	70.0	
101.5	35.0	55.0	105.0	39.0	96.0	30.0	85.0	19.0	70.0	
101.5	35.0	40.0	96.8	47.0	101.5	34.0	90.0	25.0	75.0	
101.5	35.0	46.0	101.0	69.0	96.0	57.0	95.0	49.0	89.0	
101.5	35.0	68.0	90.8	44.0	86.8	35.0	83.0	25.0	68.0	
101.5	35.0	47.5	107.0	36.0	100.0	18.0	95.0	9.0	62.0	
101.5	35.0	40.0	103.0	57.0	97.0	42.0	88.0	24.0	80.0	
101.5	35.0	60.0	103.0	60.0	94.0	53.0	89.0	39.0	81.0	
101.5	35.0	60.0	88.0	55.0	87.0	42.0	81.0	31.0	69.0	
101.5	35.0	45.0	69.0	46.0	90.0	45.0	75.0	42.0	73.0	
101.5	35.0	69.0	96.0	69.0	94.0	64.0	89.0	49.0	81.0	
101.5	35.0	67.0	97.5	62.0	94.0	54.0	93.0	39.0	82.0	
101.5	35.0	60.0	100.5	56.0	94.0	43.0	87.0	30.0	80.0	
101.5	35.0	57.5	100.5	57.0	96.0	47.0	86.0	35.0	78.0	
101.5	35.0	37.6	96.0	51.4	88.0	23.0	80.0	4.0	69.0	
101.5	35.0	50.0	98.0	60.0	93.9	37.0	84.0	25.0	72.0	
101.5	35.0	59.0	91.0	55.0	86.0	46.0	83.0	40.0	79.0	
101.5	35.0	49.6	101.0	45.6	95.0	41.0	86.0	27.0	75.0	
101.5	35.0	54.0	98.7	50.0	98.0	38.0	87.0	26.0	72.0	
101.5	35.0	60.0	98.0	54.0	98.0	37.0	86.0	25.0	74.0	
101.5	35.0	41.0	103.4	36.0	100.0	45.0	97.0	32.0	85.0	
101.5	35.0	52.0	103.0	48.0	95.0	29.0	87.0	10.0	69.0	
101.5	35.0	53.0	96.1	47.0	94.0	36.0	85.0	18.0	71.0	
101.5	35.0	42.0	97.0	36.0	94.0	37.0	90.0	30.0	81.0	
101.5	35.0	59.0	101.0	40.0	91.3	29.0	92.0	19.0	66.0	
101.5	35.0	42.0	93.0	44.0	91.0	29.0	77.0	5.0	68.0	
101.5	35.0	52.0	105.0	48.0	93.0	28.0	86.0	1.0	76.0	
101.5	35.0	42.0	103.0	45.0	93.0	34.0	85.0	15.0	71.0	
101.5	35.0	50.0	98.8	50.0	97.0	29.8	85.0	22.0	69.0	
101.5	35.0	46.0	101.6	41.0	99.3	30.0	90.0	10.0	83.0	
101.5	35.0	50.4	97.3	45.0	94.2	33.0	86.0	8.0	69.0	
101.5	35.0	45.0	93.0	45.0	90.0	30.0	78.0	8.0	65.0	
101.5	35.0	49.0	88.0	48.0	81.0	35.0	80.0	24.0	64.0	
101.5	35.0	56.0	101.0	52.0	98.0	37.0	88.0	26.0	81.0	
101.5	35.0	52.0	105.0	50.0	104.0	42.0	94.0	28.0	82.0	
101.5	35.0	61.0	93.0	38.0	92.0	40.0	85.0	28.0	73.0	
101.5	35.0	69.0	89.0	60.0	84.0	26.0	75.0	17.0	61.0	
101.5	35.0	40.0	101.3	70.0	99.4	39.6	94.0	39.3	86.0	
101.5	35.0	56.0	92.5	42.5	94.0	59.0	87.0	45.0	82.0	
101.5	35.0	63.0	103.0	55.0	85.0	30.0	80.0	26.0	69.0	
101.5	35.0	40.0	92.0	64.0	98.0	47.0	91.0	33.0	79.0	
101.5	35.0	38.0	95.0	34.0	90.0	60.0	90.0	48.0	70.0	
101.5	35.0	40.0	74.0	40.0	86.0	30.0	75.0	10.0	49.0	
101.5	35.0	46.0	95.6	42.7	93.2	28.2	50.9	21.0	64.0	
101.5	35.0	53.0	101.0	48.0	94.5	35.0	86.0	23.0	75.0	
101.5	35.0	68.0	100.0	67.0	96.0	60.0	93.0	46.0	87.0	
101.5	35.0	56.0	100.0	66.0	98.0	56.0	92.0	40.0	84.0	
101.5	35.0	72.7	102.0	72.0	97.0	39.0	87.0	20.0	74.0	
101.5	35.0		95.4		95.0	71.5	92.0	65.0	91.0	

Table showing the highest and lowest temperatures recorded at

Stations.	Established.	January.		February.		March.		April.		May.	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Kitty Hawk, N. C.	Jan. 15, 1875	78	11	77	11	80	20	84	29	93	42
Knoxville, Tenn.	Jan. 1, 1871	74	-14	79	6	83	6	88	24	94	37
La Crosse, Wis.	Oct. 15, 1872	59	-43	65	-34	72	-23	83	10	96	29
Leavenworth, Kans.	May 21, 1871	65	-29	73	-12	84	2	89	13	94	21
Lewiston, Idaho.	July 1, 1879	59	-14.2	63	-13.5	78.5	12	86	30	88	85
Little Rock, Ark.	July 1, 1879	78	12	77	22	83	32	94	29	91	44
Los Angeles, Cal.	July 1, 1877	82	30	86	28	99	35.8	94	29	100	33.5
Louisville, Ky.	Sept. 11, 1871	71	-10	77.5	Zero.	79	8	88.5	21	93	86
Lynchburg, Va.	May 24, 1871	72	-4	75	5	79	17	91.5	25	94	87
MacKinnaw City, Mich.	Aug. 20, 1882	37	9	43	-11	60	9	61	3	79.5	26
Macon, Fort, N. C.	May 23, 1878	63	-22	70	20	69	30.3	73	30	91	48
Maginnis, Fort, Mont.	July 14, 1882	45	-29	57	-35	58	1	64	14	68	19
Marquette, Mich.	May 1, 1871	56	-26	69	-27	70	-14	81	3	92	22
Memphis, Tenn.	Feb. 28, 1871	73	2	79	13	85	18	88	27	96	41
Milwaukee, Wis.	Nov. 1, 1870	59	-25	60	-22	70	8	82	12	90	25
Mobile, Ala.	Nov. 7, 1870	78	15	78	28	85	31	90	30	98	47.5
Montgomery, Ala.	Nov. 9, 1870	78.5	14	81.2	22	86.3	25	90	30	98	44
Moorhead, Minn.	Jan. 1, 1881	37	-42	49	-33	50	-22	74	-18	88	26
Mt. Washington, N. H.	Dec. 1, 1870	42	-46	43	-42	47	-49	50	-18	62	1
Nashville, Tenn.	Nov. 1, 1870	74	8	77.4	9	81.7	11	90	25.5	93	37
New Haven, Conn.	Dec. 10, 1872	63	-14	65	-4	69	8	75	16	89	30.5
New London, Conn.	Jan. 16, 1871	65	-10	62	-6	64	6	74	19	89	32
New Orleans, La.	Nov. 1, 1870	78	20	80	32.5	84	36.5	86	38	92	56
New York City.	Nov. 1, 1870	64	6	69	-4	72	3	81	20	94	34
Norfolk, Va.	Jan. 1, 1871	80	8	81	9	81	16	92	27	94	30
North Platte, Nebr.	Sept. 18, 1874	70	-27	68.3	-29	86	-31	92	12	94	30
Olympia, Wash. T.	July 1, 1877	53	9	58	8	71	23	82	26	92	34
Omaha, Nebr.	Nov. 1, 1870	62	-22.1	66	-24.9	82	-7	89	6	92	28
Oswego, N. Y.	Nov. 1, 1870	64	-13	61	-10	67	-11	78	13	94	31
Palestine, Tex.	Dec. 3, 1881	73.5	7	78	13.5	84	34	87.5	43.5	90	50
Pensacola, Fla.	Oct. 27, 1879	73.0	29	78.3	31	79.2	36	87.2	47	96	36
Philadelphia, Pa.	Jan. 1, 1871	67	-5	75	-1	75	5	87	17	95	36
Pike's Peak, Colo.	Nov. 1, 1873	30	-37	29	-37	43	-29	39	-21	47	8
Pittsburg, Pa.	Nov. 1, 1879	75	-12	76.5	-10	80	-2	88	7	95	27
Port Huron, Mich.	July 25, 1874	64	-14.7	59	-30	73	-8	81.4	7	88	26.2
Portland, Me.	Jan. 15, 1871	58	-11.5	58	-7	65	-7	78	14	94	34
Portland, Oreg.	Nov. 1, 1871	58	3	63	7	78.5	25.5	85	28	98	33
Prescott, Ariz.	Nov. 19, 1873	71	-17	80	-11	90	8	96	13	90	26
Provincetown, Mass.	Feb. 15, 1882	45.5	-3.5	44.5	-13.5	55	7	64	23	74.5	34
Pyramid Hb'r, Alaska	Oct. —, 1881	43	-13	48	-13	50	-13	68	14	70	30
Red Bluff, Cal.	July 1, 1877	71.5	19	80	23	85	28	90	84.9	101.4	37
Rio Grande City, Tex.	May 28, 1875	96	19	92	32	98	33	109	43	112	49
Rochester, N. Y.	Nov. 1, 1870	69	-12	63	-12	69	-7	83.5	11	90	28
Roseburg, Oreg.	July 15, 1877	65	12	68.5	9.4	80	19	84.5	20	95.5	33
Sacramento, Cal.	July 1, 1877	64	22	73.5	22	80	29	84	29.8	98	29
Saint Louis, Mo.	Nov. 1, 1870	72	-16	73.2	-3	82	8	87.5	22	93	33
St. Michael's, Ft. Alaska	June 28, 1874	43.6	-47	41	-52	41	-39	44	-27	57	2
Saint Paul, Minn.	Nov. 1, 1870	49	-31	59	-32	68	-22.5	82	7	94	24
Saint Vincent, Minn.	Sept. 5, 1880	35	-44	42	-38	49	-31	73	-14	85	21
Salt Lake City, Utah	Mar. 22, 1874	64	-20	68	Zero.	77	4	82	19	91	32
San Diego, Cal.	Nov. 1, 1871	78	32	82.6	55	90	36	87	39	94	45.4
Sandusky, Ohio	Aug. 2, 1877	64	-16.5	70	Zero.	67	10	80	14	92	34
Sandy Hook, N. J.	Dec. 10, 1873	63	-3	71	Zero.	70	10	77	12	93	33
Sanford, Fla.	Sept. 1, 1882	66	46	86	50	86	48	90.3	53.4	93	51
San Francisco, Cal.	Mar. 8, 1871	69	36	70.5	35	77	39	81	40	86	45
Savannah, Ga.	Jan. 1, 1871	80	18	80	29	87	27	89	32	98	48
Shaw, Fort, Mont.	April 1, 1880	50	-33	58	-37	71	-18	90	-4	94	21
Shreveport, La.	Sept. 3, 1871	78	6	80.5	22	90	26	93	32	101	42.5
Sill, Fort, Ind. T.	June 28, 1875	75	9	79	-3.5	95	10	96	26	97	41
Sitka, Alaska	Mar. 30, 1881	50.8	8.5	49.8	4	55.8	5.5	65.7	25.5	69.2	31
Smithville, N. O.	Oct. 15, 1875	73	16	72	18	74	21	81	29	90	29
Spokane Falls, Wash. T.	Feb. 5, 1881	47.2	-27.7	52	-25.1	74	7	73	26	84	33.9
Springfield, Ill.	July 1, 1879	64	-10	72	-2.4	73	13.5	85	19	93	31
Stockton, Fort, Tex.	Feb. 26, 1878	82	2	83	8	92	15	101	24.2	104	41.5
Thatcher's Island, Mass.	Dec. 22, 1875	60	-8	60	-4	66	6.5	76	18	86	37.5
Thomas, Camp, Ariz.	Sept. 23, 1877	70	12.8	75	18	85	23	92	24.3	97	39
Toledo, Ohio.	Nov. 1, 1870	66	-14	65	-12	75	-3	85	12	97	24
Unalakshia, Alaska	Aug. 18, 1878	52	19	51	7	50	5	53	18	60	37
Verde, Fort, Ariz.	Nov. 9, 1874	73	1.4	81	10	90	11	96	27	97	46
Vicksburg, Miss.	Sept. 10, 1871	80	10	83.1	21	85	27	90	31	96	32.5
Washington City	Nov. 1, 1871	71	-14	78	-1.5	79	4	90	22.5	96	30.5
Weet Las Animas, Colo.	Jan. 1, 1881	61.5	-21.5	63	-22.5	77	6	82.5	18	91	28
Wilmington, N. C.	Jan. 1, 1871	77	15	81	15	84	20	90	28	95	34
Yankton, Dak.	April 1, 1873	67	-32	68	-23	87	-16	89	-3	94	7
Yuma, Ariz.	Nov. 18, 1873	80	22.5	90	25	100	31	105	40	108.7	49

stations of the Signal Service, United States Army, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	55	100	62	99	62	95	53	90	38	79	23	73	8
96	47	100	58	100	50	97.1	40	90.6	25	80.5	11.5	75	5
98	40	101	52	96	44	92	31	84	18	70	21	60	37
99	45	104	53.5	107	52	101	37	89	19	77	Zero.	72	14
98	43	100.8	48	106.6	45	98.5	34	84	28	68.2	13	63	16
98	55	104	61	102	60	97	47	90	39	83	10	74	6
108.5	47	98.1	51.2	96.8	50	108.5	44	96.5	42.5	86	34.2	88.2	30
100	49	102	57	104.6	56	99	42	88	27	78	4.5	74	7
97	49	101.8	55	100	50	98.3	40	88	28	80.2	13	73	5
76.2	35.7	80.2	46.8	83.2	42.8	80	34	77	24	60	8.4	51.5	2.8
88	57	89.5	65	91	63	87	58	87	47	78	28	69	17
92	53	92	41	100	30	88	29	84	14	60	16	58	14
95	31	100	40.3	96	34.7	97	28	87	18	66	9	59	20
100	54	99	60	102	50	98	44	92	29	82	16	74	3
94	40	95	50	98	42	94	32	83	22	70	5	63	21
100	61	101	63.8	100	67	96	53	91	34	82	27	77	14
105.5	58	106.9	60.8	103	61.5	97	51.5	95	33	83	21	77	8
103	32	95.1	43	93.5	38	88	17	71	15	55	15	55	34
71	15	72	27	74	20	65	11	59	3	47.3	40	41	47
99	49	101.2	56.8	104	54.7	98.2	41	89	28	80.6	13	75	2
92	42	95	51	90	46	100	35	86	24	71.5	2	62	6
89	43	93	51	90	48	92	37	82.7	27.2	72	4	60.5	7.5
97	65	96	69.8	96.5	69	92	58	88	40	82	31.5	78	20
95	47	99	57	96	53	100.2	36	88.7	31	74	7	66.2	6
102	53	102.5	60	90	58	96	50.5	89	31	80	20	73	6
101	33	107	45	103	42	101	21	89	11	79	10	67	27
95	36	93.5	40	86	41	81	31	73	23	59	21	59	8
98	42	105	51	105	49	98.8	30	87	15	74	6	66	17
98	40.5	100	49	97.5	49	93.4	36	84	28	71	1	65	14
96	55	98	63	97	64	95.5	49	94	41	86	26.5	76	23
97	64	97	64.2	93	69	93	57.3	89	45	81.3	28.1	76	17
97	49	100	56	99	53	101.5	43	87	31	77	8	70	5
63	2	64	18	62	15	55	6	47	17	33	36	30	37
98	39	102.7	52	96.8	49	101.6	35	91	28	79	4	69	9
90	87	95	48.9	96.5	46	97	31	86	24	67.6	6	65	14
94	42	97	51	95	48	94.5	37	83	28	66	6	57	17
99	42	95.5	46	91	43	90	39	79	31	68	22.5	63	3
102	32	103	42	90	38	00	29	86	18	75	1	70	18
90	45.5	193	52	90.5	53	179	45.5	73	34.1	68	22.8	53.5	0.4
75	37	74	43	74	39	69	82	65	21	44	9	42	9
105	47	110	53	110.5	52	106	50	94	32	80	26	74	25
109	62	109	62	112	68	107	53	105	43	92.7	80	88	24
94	36	96	48	96	47	98	84	87	19	71	1	70	11
96.5	37.5	97	40	94.5	40.5	90	34.6	76	22.5	66	17.5	65	7
102.5	48	103.5	51	103	49	101	44.4	88	36.4	76	27	68	22.5
99	48	104	57	106.4	55	101.5	40	90	25	82	5	74	17
75	22	75	23	67	32	66.5	19	60	3	42	24	45	43
94	39	100	46	98	43	94	30	87	15	72	24.5	56	39
93	29	93	40	90	36	89	17	77	11	57	22	42	42
100	37	96	45	101	44	93	36	83	22	70	8	61	10
94	51	86	54	86	54	101	49.5	92	44	85	38	82	32
92	47	96	56	98	48.5	95.8	42	87	30	75	Zero.	63	13
97	49	160	50	96.2	55	101	46	87	33	73	8	68.5	5
98	71	99.4	70	96.9	69	91	66.5	91.8	62	82.3	50.5	80.5	36
95.2	48	83	49	89	50	92	50	84	45	78	41	68	34
100	59	105	66	100	63	96	54	91.5	37	82	22	80	15
98	36	96	37	90	33	91	23.5	80	3	60	26.5	59	42
104	55	107	64	105	58	101	47	95	31	86	18	79	10
105	47	106	56	105	53	100	44	91	25	83	4	77	2
99.6	38	87.5	43	79	42.5	69.4	84.5	60.8	26	54	5	52.8	9
97	53	100	61	97.5	58	93	49	85	35	78	23	71	10
95.4	39	97.5	43	101.5	38	87	31	70.4	18	58	3	50	2.2
94	48.7	101.5	54	99.5	52	94.7	38	88	26	76	6	64	14
106.6	46	106	50	105	51	100	40	96	29	87.6	12	81	8
87	40.1	89.9	50	85	45.5	95	39.5	81	28	66	9	67.4	7
109	45	109	52	105	49	100	43	89.5	26	81.5	16	73	18
95	43	97	50	97	47	95	36	86	25	72	5	66	15
98	34	78	37	78	36	68	33	62	24	58	19	50	12
108.5	45	114	48	106	51	104	34	95	27.3	80	8	71	6
101	53	100	62	100	62	98	48	93.4	34	84.5	23	79	12
102.5	46.5	102	57	101	50	104.3	38	92.3	26	80	12.5	73	18
100	40.5	104	52	101	49.5	97.5	35	90	19	77	1	69	6.5
100	52	103	62	99	56	96	47	90	32	83	20	78	10
97	38	103	44	103	45	100	26	90	9	76	15	63	34
117	56	118	61	115	64	113	50	102	41.4	91	31	80	27



## APPENDIX 38.

Table showing the highest temperatures (in degrees Fahrenheit) recorded at Signal Service each, to Decem

[Obtained from self-

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Albany, N. Y .....	50	1876	58	1880	64	1878	80	1881	92	1880
Alexander, Fort, Alaska.....	40	1882, 1883	37	1883	41	1883	48	1882	61	1882
Alpena, Mich .....	52	1876, 1880	58	1880	66	1879	76	1881	91	1874
Apache, Fort, Ariz.....	67	1881, 1882	74	1881	83	1879	80	1879	93	1881
Aassinabone, Fort, Mont .....	46	1882	56	1882	67	1882	81	1881	79	1881
Atlanta, Ga .....	73	1879, 1882	74	1880	81	1882	86	1880	91	1879
Atlantic City, N. J.....	64	1880	71	1880	72	1880	79	1878	80	1877, 1880, 1881
Augusta, Ga .....	79	1879	81	1880	80.3	1882	90	1880	100	1878
Baltimore, Md .....	71	1876	78	1874	76	1880	84	1881	96	1881
Barnegat City, N. J .....	61	1874, 1879, 1880	70	1880	73	1880	79	1880	91	1880
Behring's Island, Behring Sea .....	33	1883	38	1883	33.9	1883	38	1883	43.6	1883
Bennett, Fort, Dak .....	55	1882	63	1882	78	1882	86	1882	92	1881
Benton, Fort, Mont .....	58	1880	62	1882	74	1882	81	1880	93	1875
Bismarck, Dak .....	49	1880	60	1877, 1882	72	1878	80	1881	92	1880
Block Island, R. I .....	56	1883	51.5	1883	54	1883	62	1883	78.3	1881
Boise City, Idaho .....	57	1880	64	1879	76	1881	80	1879	88	1881
Boston, Mass .....	69.5	1876	64	1880	72	1880	85	1872	97	1880
Brownsville, Tex .....	83	1876	85	1876	92	1876, 1879	97	1878, 1879	90	1877
Buffalo, N. Y .....	65.5	1874	63.8	1883	72	1875	82.6	1883	87	1876
Butford, Fort, Dak .....	47	1880	57	1882	70	1879, 1882	92	1881	96	1880
Cairo, Ill .....	70	1876, 1880	74	1882	84	1879	80	1872	92	1874
Cape Henry, Va .....	78	1876	80	1880	83	1879	85	1876, 1878, 1880, 1881	93	1875
Cape May, N. J .....	58	1874, 1876	59	1880	65	1880	76	1879	81	1874, 1880
Cedar Keys, Fla .....	77	1880	79	1883	82	1882	88	1880	91	1880, 1881
Charleston, S. C .....	80	1879	78	1876, 1880, 1882, 1883	85	1882	87	1880	94	1878
Charlotte, N. C .....	70	1879, 1880	76.5	1883	79	1879, 1880	85	1880, 1881	94.4	1881
Chattanooga, Tenn .....	73	1879	74	1880, 1883	82.5	1882	88	1880	93	1879
Cheyenne, Wyo .....	63	1880	59	1879, 1880, 1881	77	1879	80	1874	88	1874
Chicago, Ill .....	65	1876	63	1876, 1880	73	1875	83	1873	80	1874

## APPENDIX 38.

stations for each month of the year (compiled from the commencement of observations at  
ber 31, 1883.)

registering thermometers.]

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
92	1874	93	1876, 1880	93	1876	96	1881	84	1881	70	1876	63	1881	96	1881
78	1883														
97	1874	97	1876	92	1878	92	1881	83	1879	63	1874	56	1875	97	1874, 1876
101	1883	102.5	1881	96	1879	96	1883	83	1881	77	1882	70	1881, 1882	102.5	1881
101	1883	95	1882	96	1882	96	1882	76	1880	63	1883	56	1881	101	1883
94.5	1881	97.5	1881	96.2	1881	90.5	1881	86	1883	80.5	1882	71	1879	97.5	1881
98	1874, 1880, 1881	99	1880	91.8	1881	94	1880	83	1881	72	1882	64	1877	99	1880
101.8	1881	105	1878	105	1878	97	1875	92	1883	84	1879	77	1874, 1875, 1880	105	1878
97.5	1874	99	1876, 1879, 1880	96	1881	101	1881	89	1879, 1881	78	1879	71	1881	101	1881
95.6	1882	96	1879	95	1874	96	1881	82.5	1881	73	1879	63	1875	96	1879, 1881
98.7	1883	55.0	1883	63.6	1882	58.5	1882								
98	1881	101	1881	104	1881, 1882	95	1882, 1883	90	1880	65	1881	62	1881	104	1881, 1882
101	1881	107	1881	108	1881	95	1881	87	1875	70	1873	67	1881	108	1881
99	1883	102	1881	105	1876	94	1882	88	1879	67	1876	60	1881	105	1876
81.5	1882	86	1881, 1882	82	1882	86.5	1881	75.4	1881	70	1881	59.5	1882	86.5	1881
96	1883	106	1877	105	1883	96	1879	85	1879, 1880	70	1878	59	1879	106	1877
98	1874	101	1880	96.8	1881	101.5	1881	90	1881	75	1876	66	1881	101.5	1881
102	1878	98	1877	101	1883, 1877	96	1877, 1878, 1883, 1879	95	1877	89	1882	83	1875, 1880	102	1878
92	1878	90	1878	90.8	1881	86.8	1881	83	1879	68.3	1881	62	1875	92	1878
107	1883	104	1881	107	1882	100	1882	95	1879	62	1879	51	1881	107	1882, 1883
96	1872	99	1874, 1881	103	1881	97	1881	88	1872, 1881	80.5	1882	72	1875	103	1881
96	1874	101	1875, 1878	103	1881	94	1875, 1877, 1881	89	1879, 1881, 1883	81	1876, 1870, 1883	76	1875	103	1881
89	1873, 1880	91	1872	88	1873, 1877	87	1880	81	1879, 1881	69	1879	62	1881	91	1872
94	1880	94	1880, 1881	96	1883	94	1881	89	1881	81	1881, 1882	78	1881	96	1883
100	1877, 1880	104	1879	97.5	1881	94	1876	93	1883	82	1879	76	1881	104	1879
97	1881	101	1879	100.5	1881	94	1881	87	1879, 1881	80	1879	70	1879, 1881	101	1879
95	1881	101	1879	100.5	1881	96	1881	86	1879	78	1882	72	1879	101	1879
97	1880, 1881	100.5	1881	96.1	1882	88	1875	80	1873, 1874, 1879	69	1876	64	1877	100.5	1881
96	1872	99	1874	96	1874	93.9	1881	84	1879	72	1874, 1882	68	1875	99	1874

Table showing the highest temperatures (in degrees Fahrenheit) recorded at

Stations.	January.		February.		March.		April.		May.	
	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
Chinoctague, Va.....	60	1882	71	1883	72.2	1882	79	1881	88	1881
Cincinnati, Ohio.....	69	1876	78	1883	77	1875	85	1872, 1873	94	1874, 1876
Cleveland, Ohio.....	70	1874	72	1883	76	1875	85	1872, 1883	92	1879
Columbus, Ohio.....	64	1880	72	1883	71	1879	86	1883	92	1881
Concho, Fort, Tex.....	78	1879	87	1880	97	1879	98	1880	107	1879
Custer, Fort, Mont.....	60	1880	65	1881	76	1882	85	1881	84	1880, 1881, 1882, 1883
Davenport, Iowa.....	60	1874	66.7	1882	74	1875	81	1879	90	1874
Davis, Fort, Tex.....	77	1880	79	1879	87	1879	95	1879	101	1881
Dayton, Wash. T.....	61	1880	64	1881	83	1881	91	1880	90	1880
Deadwood, Dak.....	62	1883	62	1883	73	1882	82	1881	84	1880
Delaware Breakwater, Del.....	56	1882	66	1880	83	1880	79	1880	89	1880
Denver, Colo.....	67	1882	72	1879	81	1879	83	1874	92	1874
Des Moines, Iowa.....	63	1880	68	1880	80	1880	89	1883	93	1880
Detroit, Mich.....	65	1876	60	1880	75	1875	78.5	1883	90.5	1881
Dodge City, Kans.....	70	1876	78	1876	89	1879	92	1880	98	1879, 1880
Dubuque, Iowa.....	62	1874	67.2	1882	75	1875	84	1879	94	1874
Duluth, Minn.....	51	1877	57	1877	62	1878, 1879	75	1881	91	1874
Eastport, Me.....	51	1874	47	1874, 1878	53	1878	63	1877	80	1877
Elliott, Fort, Tex.....	81	1880	78	1880	86	1880	96	1880	94	1880
El Paso, Tex.....	74	1880, 1881	82	1879	88	1879, 1882	98	1879	101	1879, 1881
Erie, Pa.....	73	1876	70	1883	78	1875	86	1883	91	1879
Escanaba, Mich.....	45	1879	52	1877	57	1879	65	1875, 1880	83	1881
Fort Smith, Ark.....	68.5	1883	78.4	1883	82.5	1883	88.5	1883	93.3	1883
Galveston, Tex.....	75	1876, 1880, 1882	75	1882	85	1879	85	1878	91	1875, 1877
Grand Haven, Mich.....	57	1880	58	1880	71	1878	80	1883	86	1877
Grant, Fort, Ariz.....	77	1879	80	1879	87	1879	98	1879	94	1879
Hatteras, N. C.....	64	1882	69	1882	69	1882	75	1881	88	1881
Helena, Mont.....	50	1883	60	1881	66	1881	73	1881	77	1880, 1881, 1882
Huron, Dak.....	45.5	1882	57.2	1882	74.8	1882	81.2	1882	78.8	1882
Indianapolis, Ind.....	69	1876	72	1883	77	1875	85.3	1883	89	1874, 1881
Indianola, Tex.....	80	1880	80	1875, 1880	90	1879	91	1877	95	1879
Jacksonville, Fla.....	80	1875, 1876, 1877- 1879	83	1876, 1883	88	1882	91	1874, 1880	98.5	1878
Keokuk, Iowa.....	64	1874	69	1882	80	1875	85	1883	92	1874
Key West, Fla.....	90	1877	87	1874	89	1873, 1878	91	1881	92.2	1881
Kitty Hawk, N. C.....	78	1876	77	1880	80	1880	84	1878, 1880	93	1880
Knoxville, Tenn.....	74	1876	79	1871	83	1882	88	1872	94	1877

## REPORT OF THE CHIEF SIGNAL OFFICER.

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Signal Service stations for each month of the year, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
93	1880	94	1881	91	1881	86	1880, 1881, 1882	88	1888	79	1882	64	1881	94	1880, 1881
98.5	1874	103.5	1881	101	1881	95	1881	96	1879	75	1879	72	1875	103.5	1881
96	1874	96	1878	98.7	1881	96	1881	87	1879	72.5	1882	68	1875	98.7	1881
93	1879	108	1881	96	1881	96	1881	96	1879	74	1879	68	1881	103	1881
110	1882	106	1879	108.4	1882	100	1879	97	1877	85	1882	90	1879, 1880	110	1882
107	1882	108	1881	108	1882	95	1882	87	1879	69	1879	61	1881	107	1882
98	1874	96	1874	98.2	1881	94	1881	85	1879	71	1874, 1879	68	1877	96	1874
111	1881	110	1881	97	1881, 1882	94	1882	90	1881	81.6	1883	80	1881	111	1881
97	1880	102	1880	101	1882	91.3	1881	92	1880	66	1883	58.2	1881	102	1880
95	1880, 1881	102	1881	101	1881	91	1881	77	1880	68	1878	58.7	1882	102	1881
99	1880	91	1880	98	1881	98	1881	84	1881	73	1881	69	1881	98	1881
99	1878	102.2	1874	105	1878	93	1878	86	1878	76	1876, 1879	71	1874	105	1878
95.5	1881	96.5	1881	103	1881	98	1881	85	1879	71	1882	57	1882	103	1881
98	1874	100	1878	98.8	1881	97	1874	85	1879	69	1879, 1882	65	1875	100	1878
102	1880	106	1876	101.6	1881	98.3	1881	90	1882	83	1875	73	1875	106	1876
96	1874	101	1874	97.2	1881	94.2	1881	86	1879	69	1874, 1879	64	1877	101	1874
92.2	1883	99	1883	98	1881	90	1874	78	1879	65	1874	51	1882	99	1883
81	1878	86	1873, 1880	88	1880	81	1881	80	1879	64	1882	54	1877	88	1880
100	1880, 1881	102	1881	101	1881	96	1881	88	1880	81	1882	83	1880	102	1881
112	1882	110	1882	105	1882	104	1879	94	1879	82	1882	74.8	1881	112	1882
91	1874	94	1878	98	1881	92	1881	85	1879	73	1882	68	1875	94	1878
86	1874	92	1874, 1878	89	1876, 1878	84	1880	75	1879	61	1874	48	1875	92	1874, 1878
101	1882	100	1882	101.2	1882	98.4	1882	94	1883	86	1882	78.1	1882	101.2	1882
97	1875	97	1875	98.5	1874	94	1875, 1876	87	1875, 1877, 1879, 1881, 1882	82	1875, 1876	75	1879, 1881, 1882	98.5	1874
96	1874	90	1878	92	1881	85	1878	80	1879	69	1874	61	1877	92	1881
101.5	1882	100	1879, 1880	108	1879	98	1879	91	1878	79	1878, 1879	74	1878	103	1879
91	1882	92	1881	92	1881, 1882	90	1881	90	1881	79	1882	68	1880, 1881, 1882	92	1881, 1882
95	1880	96	1880	95	1880	86	1882	75	1880	60	1883	52	1883	96	1880
94.1	1882	98.2	1882	95.6	1881	92.2	1882	86.9	1882	64.0	1881	58	1881	98.2	1882
98	1874	101	1881	101	1881	94.5	1881	86	1879	75	1879	68	1875	101	1881
96	1878	98	1873, 1876, 1879	100	1874, 1877	96	1877	92	1877	87.8	1882	79	1879	100	1874, 1877
100.5	1880	104	1879	100	1874	98	1875	92	1882	84	1875, 1877	81	1875	104	1879
96	1878	100	1874	102	1873	97	1881	87	1879	74	1874, 1882	68	1875	102	1873
95.5	1881	97	1880	95.4	1881	95	1872	92	1876	91	1876	88	1876	97	1880
99	1880	100	1876	99	1881	95	1880	90	1881	79	1879	72	1875, 1879	100	1876
98	1880	100	1879	100	1881	97.1	1881	90.5	1879	80.5	1881	75	1874	100	1879, 1881

Table showing the highest temperatures (in degrees Fahrenheit) recorded at

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
La Crosse, Wis.....	50	1874	65	1882	72	1875	83	1879	96	1874
Leavenworth, Kans.....	65	1876	73	1876	84	1879	89	1880	94	1873, 1875
Lewiston, Idaho.....	50	1880	68	1881	78.5	1882	86	1880	88	1881
Little Rock, Ark.....	78	1880	77	1882	83	1882	94	1880	91	1880
Los Angeles, Cal.....	83	1888	86	1881	90	1879	94	1881	100	1883
Louisville, Ky.....	71	1876	77.5	1882	79	1879	88.5	1882	88	1881
Lynchburg, Va.....	73	1876, 1879	75	1874	79	1879	91.5	1873	94	1877
Mackinaw City, Mich.....	87	1883	43	1883	50	1883	61	1882	73.5	1883
Macon, Fort, N. C.....	68	1882	70	1882	60	1881	73	1882	81	1881
Maginnis, Fort, Mont.....	45	1883	57	1888	58	1888	64	1882	68	1883
Marquette, Mich.....	56	1880	59	1877	70	1878	81	1877	92	1873
Memphis, Tenn.....	73	1876	79	1883	85	1879	88	1882, 1883	96	1879
Milwaukee, Wis.....	50	1871	60	1882	70	1878	82	1871	90	1874
Mobile, Ala.....	78	1882	78	1883	85	1879	90	1881, 1-83	96	1878
Montgomery, Ala.....	78.5	1882	81.2	1883	86.2	1882	90	1880	98	1875
Moorhead, Minn.....	37	1883	49	1882	50	1882	74	1882	88	1881
Mount Washington, N. H.....	42	1874	43	1883	47	1876	50	1883	62	1878
Nashville, Tenn.....	74	1879	77.4	1883	81.7	1882	90	1872	98	1874, 1879
New Haven, Conn.....	63	1876	65	1880	69	1880	75	1880	89	1880
New London, Conn.....	65	1880	62	1880	64	1878	74	1880	89	1881
New Orleans, La.....	78	1879	80	1883	84	1879	86	1882	92	1877
New York City.....	64	1876, 1880	69	1874	73	1879	81	1872, 1877	94	1880
Norfolk, Va.....	80	1871	81	1871	81	1880	92	1871	98	1880
North Platte, Nebr.....	70	1880	68.3	1882	86	1879	92	1880	94	1880
Olympia, Wash. T.....	58	1881	58	1881	71	1881	82	1880	87	1878
Omaha, Nebr.....	62	1879, 1880	66	1880	82	1879	89	1880	92	1880
Oswego, N. Y.....	64	1874	61	1880	67	1871	78	1872	84	1879
Palestine, Tex.....	73.5	1883	78	1882	84	1882	87.5	1883	90	1883
Pensacola, Fla.....	78.6	1882	78.2	1883	78.2	1882	87.2	1883	93	1881
Philadelphia, Pa.....	67	1876	75	1874	75	1880	87	1872	96	1880
Pike's Peak, Colo.....	80	1879	29	1876	43	1879	39	1876	47	1880
Pittsburg, Pa.....	75	1874	76.5	1883	80	1876	88	1878	95	1881
Port Huron, Mich.....	64	1876	59	1880	73	1875	81.4	1883	88	1881
Portland, Me.....	58	1876	58	1880	65	1874	78	1881	94	1880
Portland, Oreg.....	58	1876, 1877	63	1881	76.5	1881	85	1880	88	1878
Prescott, Ariz.....	71	1882	80	1879	90	1879	86	1879	90	1873
Provincetown, Mass.....	46.5	1883	44.5	1883	53	1882	64	1882	74.5	1883
Red Bluff, Cal.....	71.5	1880	80	1883	85	1881	90	1878	101.4	1881
Rio Grande City, Tex.....	80	1879	92	1882	98	1879	100	1878	112	1879
Rochester, N. Y.....	69	1874	63	1875	69	1875	83.5	1883	89	1879

Signal Service stations for each month of the year, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
98	1874	101	1874	96	1874, 1881	92	1878	84	1879	70	1874	60	1877	101	1874
99	1875	104	1874	107	1874	101	1882	89	1871, 1874	77	1874	72	1875	107	1874
98	1883	104.6	1882	106.6	1882	93.5	1888	84	1880	63.2	1883	54	1880, 1883	106.6	1882
98	1883	108	1879, 1881	102	1881	97	1881	90	1881, 1883	83	1882	74	1880, 1883	102	1881
103.5	1879	96.1	1882	96.8	1881	103.5	1888	96.5	1879	86	1877	88.2	1878	103.5	1879, 1888
100	1874	102	1874	104.6	1881	99	1881	88	1879	78	1879	74	1875	104.6	1881
97	1874	101.8	1881	100	1881	98.8	1881	88	1879	80.2	1882	73	1873	101.8	1881
78.8	1888	80.2	1883	83.2	1888	80	1882	77	1882	60	1882	51.5	1888	83.2	1888
88	1881	89.5	1883	91	1888	87	1881	87	1881	78	1882	69	1881	91	1881, 1888
92	1883	92	1882	100	1882	88	1882	84	1882	60	1888	58	1883	100	1882
95	1879	100	1878	96	1879	97	1874	87	1879	66	1874	59	1873	100	1878
100	1881	99	1879, 1875, 1881	102	1881	98	1881	92	1879	82	1879	74	1875	102	1881
94	1872, 1874	95	1871, 1874, 1878	98	1874	94	1872, 1874	83	1871	70	1874, 1882	68	1877	98	1874
100	1877, 1882	101	1883	100	1874	96	1881	91	1883	82	1879, 1882	77	1880	101	1883
105.5	1881	106.9	1881	103	1874	97	1875	95	1883	83	1879, 1882	77	1880	106.9	1881
100.3	1888	95.1	1881	93.5	1882	88	1882	71	1882	55	1883	55	1883	100.3	1883
71	1878	72	1881	74	1872	65	1880	59	1871	47.3	1881	41	1873	74	1872
99	1874	101.2	1881	104	1874	98.2	1881	89	1879, 1881	80.6	1882	75	1874	104	1874
92	1880	95	1876	90	1872, 1876, 1881	100	1881	86	1881	71.5	1882	62	1875	100	1881
89	1880	98	1876, 1878	90	1873	92	1881	82.7	1879	72	1882	60.5	1879	98	1876, 1878
97	1881	96	1877	96.5	1877	92	1875, 1877, 1881	88.7	1883	82	1879, 1882	78	1875, 1879, 1880, 1881	96.5	1877
95	1875	99	1876	96	1881	100.2	1881	88.3	1881	74	1882	66.2	1881	100.2	1881
102	1874	102.5	1876	99	1881	96	1880	89	1881	80	1879	73	1878, 1874, 1875, 1879	102.5	1876
101	1876	107	1877	103	1878	101	1881	89	1879	79	1876	67	1878	107	1877
95	1876	98.5	1880	86	1882	81	1877, 1879	73	1880	59	1879	59	1880	95	1878
96	1881	105	1874	105	1874	98.8	1881	87	1879	74	1874	66	1875	105	1874
98	1875	100	1878	97.5	1883	93.4	1881	84	1877	71	1876	65	1875	100	1878
96	1882	96	1882	97	1883	95.5	1883	94	1883	86	1882	76	1881	96	1882
97	1881	97	1881	93	1880, 1881	93	1881	89	1881	81.3	1882	76	1880	97	1881
97	1874	100	1876	99	1881	101.5	1881	87	1879, 1881	77	1876	70	1873	101.5	1881
63	1881	64	1879	62	1878	53	1875	47	1879	83	1878, 1879	30	1877	64	1879
96	1874	102.7	1881	99.8	1881	101.6	1881	91	1879	79	1876	69	1872, 1875, 1880	102.7	1881
90	1878, 1879	95	1878	96.5	1881	97	1881	86	1879	67.6	1882	65	1875	97	1881
94	1878	97	1876	95	1876	94.5	1881	83	1879, 1881	66	1882	57	1881	97	1876
89	1876	95.5	1875	91	1882	90	1876	79	1876	68	1873	63	1875, 1880	99	1876
102	1878	103	1878	99	1878	100	1879	86	1881	75	1878	70	1881	103	1878
90	1882	93	1882, 1883	90.5	1883	79	1882	73	1883	68	1882	53.5	1882	93	1882, 1883
105	1878	110	1879	110.5	1878	106	1877	94	1877	80	1879	74	1882	110.5	1878
100	1888	109	1877	112	1877	107	1877	105	1877	92.7	1883	88	1880	112	1877
94	1875	96	1881	96	1874, 1881	96	1881	87	1879	71	1876, 1879	70	1875	96	1881

*Table showing the highest temperatures (in degrees Fahrenheit) recorded at*

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Roseburg, Oreg .....	65	1878	63.7	1883	80	1881	84.5	1880	80.5	1882
Sacramento, Cal .....	64	1881	73.5	1879	80	1882	84	1881	86	1883
Saint Louis, Mo .....	73	1880	73.2	1882	82	1879	87.5	1883	83	1874
Saint Michael's, Fort, Alaska .....	43.6	1883	41	1888	41	1878,	44	1882	57	1877
Saint Paul, Minn .....	49	1879	50	1880	68	1879	82	1879,	94	1874
Saint Vincent, Minn .....	35	1881	42	1882	49	1881	73	1881	65	1881
Salt Lake City, Utah .....	54	1879	68	1879	77	1870	83	1874	81	1874
San Diego, Cal .....	78	1877	82.6	1883	99	1879	87	1876	94	1879
Sandusky, Ohio .....	64	1880	70	1883	70	1878,	80	1878	92	1879
Sandy Hook, N. J .....	63	1874	71	1874	67	1880	77	1880	88	1880
Sanford, Fla .....	85	1883	86	1883	86	1883	90.5	1883	88	1883
San Francisco, Cal .....	69	1877	70.5	1883	77	1879	81	1875	86	1883
Savannah, Ga .....	80	1879	80	1876,	87	1882	89	1878	98	1878
				1880,						
				1883						
Shaw, Fort, Mont .....	50	1882	56	1883	71	1882	80	1880	84	1881
		1876,						1880,		
Shreveport, La .....	78	1880	80.5	1876	90	1883	93	1872	101	1875
Sill, Fort, Ind. Ter .....	75	1880	79	1879,	95	1879	96	1880	97	1880
		1880								
Sitka, Alaska .....	50.8	1882,	49.8	1883	55.8	1883	65.7	1883	60.2	1882
		1883								
Smithville, N. C .....	73	1876	72	1880	74	1876	81	1878	90	1881
Spokane Falls, Wash. T .....	47.2	1883	53	1881	74	1881	72	1881	84	1882
Springfield, Ill .....	64	1880	72	1882	73	1882,	85	1883	88	1881
						1883				
Stockton, Fort, Tex .....	83	1880	88	1879	92	1879	101	1879	104	1879
Thatcher's Island, Mass .....	60	1880	60	1880	66	1880	76	1881	86	1880
Thomas, Camp, Ariz .....	70	1881	75	1881	85	1881	92	1881	97	1881
Toledo, Ohio .....	66	1873,	65	1883	75	1875	85	1872	95	1871
		1876								
Unalakha, Alaska .....	62	1882	51	1882	50	1883	53	1883	60	1882
Verde, Fort, Ariz .....	73	1879	81	1879	90	1881	96	1879	97	1879,
										1880,
										1883
Vicksburg, Miss .....	80	1879	83.1	1883	85	1878,	90	1881	95	1874,
						1880				1877
Washington City .....	71	1874,	78	1874	79	1880	90	1872	96	1880
		1876								
West Las Animas, Colo .....	61.5	1883	68	1882	77	1882	82.5	1882,	91	1883
								1883		
Wilmington, N. C .....	77	1879	81	1880	84	1878	90	1880	95	1878
Yankton, Dak .....	76	1880	68	1876	87	1879	89	1874	94	1880
Yuma, Ariz .....	80	1879	90	1879	100	1879	105	1876	103.7	1883

Signal Service stations for each month of the year, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
94.5	1878	97	1880	94.5	1882	90	1877, 1879	76	1877, 1880	66	1878	65	1880	97	1880
102.5	1882	103.5	1883	103	1879	101	1883	88	1877	76	1880	68	1882	103.5	1883
99	1881	104	1881	104.4	1881	101.5	1881	90	1879	82	1879	74	1875	104.4	1881
75	1876	75	1877	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
94	1874	100	1883	98	1880	94	1878	87	1879	72	1874	56	1877	100	1883
93	1882	93	1883	90	1882	89	1883	77	1880	57	1883	42	1883	93	1883
100	1882	98	1877	101	1875	93	1875	83	1876	7.1	1882	61	1874	101	1875
94	1877	96	1877	86	1872	101	1883	92	1879	85	1873	82	1874	101	1883
92	1880	96	1879	98	1881	95.8	1881	87	1879	76	1879	68	1879	98	1881
97	1874	100	1876	96.2	1881	101	1881	87	1881	73	1881	68.5	1881	101	1881
96	1883	99.4	1883	96.9	1883	91	1883	91.8	1883	82.3	1883	80.5	1883	99.4	1883
95.2	1883	82	1881	89	1879	92	1877	84	1871	78	1871	68	1878	95.2	1883
100	1880	105	1879	100	1878	96	1876, 1877	91.5	1883	82	1875	80	1875	105	1879
96	1880	96	1881, 1882	99	1881	91	1880	80	1880	60	1883	50	1883	99	1881
104	1875	107	1875	105	1881	101	1881	95.0	1883	86	1882	79	1875	107	1875
105	1881	106	1881	105	1881	100	1881	91	1878	83	1879	77	1880	106	1881
69.6	1882	67.5	1883	79	1881	69.4	1883	60.8	1882	54.0	1882	52.8	1883	79	1881
97	1880	100	1879	97.5	1876	98	1876	85	1875, 1879	78	1877	71	1875	100	1879
95.4	1883	97.5	1883	101.5	1883	87	1881	70.4	1883	58	1881	50	1881	101.5	1883
94	1881	101.5	1879	99.5	1881	94.7	1881	88	1879	76	1879	64	1883	101.5	1879
104.6	1881	106	1879	105	1877	100	1879	96	1878	87.6	1883	81	1879, 1881	104.6	1881
87	1882	89.9	1882	85	1876, 1879, 1880	95	1881	81	1879	66	1882	67.4	1881	95	1881
109	1883	109	1881	105	1882	100	1883	89.5	1883	81.5	1882	72	1881	109	1881, 1883
99	1872	97	1872, 1874	97	1881	95	1881	86	1872	72	1876, 1882	66	1875	99	1872
65	1881	78	1882	78	1881	68	1881	62	1881	58	1881	50	1881	78	1881, 1882
109.5	1881	114	1881, 1878	106	1878	103	1883	95	1881	80	1878	71	1878	114	1881
101	1881	100	1881	106	1878	96	1881	98.4	1883	84.5	1882	79	1873, 1875	101	1881
102.5	1874	102	1879	101	1881	104.3	1881	92.3	1881	80	1879	73	1873	104.3	1881
100	1882	104	1883	101	1882	97.5	1883	90	1881	77	1883	63	1882	104	1883
100	1880	108	1879	99	1878	96	1872	90	1883	88	1877, 1879	78	1879	108	1879
97	1876	103	1883	108	1878	100	1881	89	1879	76	1876	62	1875	108	1878, 1883
117	1888	118	1878	115	1879	113	1879	102	1876, 1879	91	1879	80	1878	118	1878



## APPENDIX 39.

Table showing the lowest temperatures (in degrees Fahrenheit) recorded at Signal Service each to Decem

[Obtained from self.]

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Albany, N. Y.....	-18	1878	-18	1875	-4	1875	13	1874	29	1874, 1876
Alexander, Fort, Alaska.....	-18	1883	-26	1882	-6	1882	8	1882	23	1883
Alpena, Mich.....	-27	1882	-27	1881	-14	1873	-2	1881	23	1883
Apache, Fort, Ariz.....	-6	1888	-9	1880	11	1881	15	1883	29	1880, 1883
Assinaboine, Fort, Mont.....	-43	1883	-47	1883	-13	1882	7	1881	29	1881
Atlanta, Ga.....	9	1879	21	1881	27	1883	25	1881	29.5	1883
Atlantic City, N. J.....	-8	1875	-5	1875	10	1876	19	1875	33	1876, 1880
Augusta, Ga.....	15	1873	23	1875	23	1873	31	1881	42	1877
Baltimore, Md.....	-6	1881	2	1873	5	1873	23.5	1875	34	1876
Barnegat City, N. J.....	-10	1875	-4	1881	10	1875	19	1875	34	1876, 1880
Behring's Island, Behring Sea.....	7.8	1883	11.6	1883	13.6	1883	10.9	1883	28.2	1883
Bennett, Fort, Dak.....	-43	1883	-34	1881	-11	1881	4	1881	30	1883
Benton, Fort, Mont.....	-55	1875	-41	1883	-42	1876	6	1875	26	1883
Bismarck, Dak.....	-37	1883	-31	1875	-25	1875	-1	1881	21	1875
Block Island, R. I.....	-4	1882	2	1881	10	1883	25	1881	36	1882
Boise City, Idaho.....	-27	1883	-13	1883	9	1883	17.5	1883	29	1878
Boston, Mass.....	-13	1882	-6.5	1876	-7.5	1872	11	1874	31	1882
Brownsville, Tex.....	18	1881	27	1883	35	1880	43	1881	49	1877
Buffalo, N. Y.....	-6	1883	-13	1875	2	1883	11	1881	29	1876
Buford, Fort, Dak.....	-46	1883	-40	1883	-23	1880	7	1880	22	1882, 1883
Cairo, Ill.....	-11	1875	4	1875	10	1873	24	1875	37	1875
Cape Henry, Va.....	9	1879	11	1876	12	1883	28	1875	41	1876
Cape May, N. J.....	1	1879	2	1875	9	1872	24	1875	34	1882
Cedar Keys, Fla.....	32	1883	35	1881	40	1881	38	1881	50	1883
Charleston, S. C.....	23	1879	26	1881	28	1876	32	1881	47	1876
Charlotte, N. C.....	11	1879, 1881	23	1879, 1881	26	1879, 1883	28	1881	40.5	1883
Chattanooga, Tenn.....	13	1881	16	1879	28	1879, 1881, 1883	25	1881	41	1879
Cheyenne, Wyo.....	-38	1875	-28	1883	-17	1880	2	1875	23	1874, 1873
Chicago, Ill.....	-20	1875	-13	1875	-12	1873	17	1875, 1879, 1881	37	1875
Chinookteague, Va.....	8	1882	5	1881	17	1883	36	1881	40	1880
Cincinnati, Ohio.....	-10	1879	-1	1875	1	1873	18	1875	35	1883
Cleveland, Ohio.....	-17	1873	-11.2	1875	-2	1873	15	1875	28.2	1876
Columbus, Ohio.....	-20	1879	-2	1881	14	1883	15	1881	34	1883

## APPENDIX 39.

stations for each month of the year (compiled from the commencement of observations at  
ber 31, 1883).

registering thermometers.]

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
40	1875, 1878	48	1876	45	1875	23	1875, 1879	23	1876	-10	1875	-17	1875	-18	1875, 1878
35	1882														
33.5	1881	45	1876, 1882, 1883	40	1883	29.3	1883	22	1873	-4	1880	-15	1880	-27	1881, 1883
36	1880, 1882	41	1879	41	1880	32	1880, 1882	19	1880	9	1880	-2	1879	-9	1880
21	1883	35	1881	37	1881	28	1882, 1883	-10	1881	-25	1880	-42	1880	-47	1883
54	1879	57.8	1882	57	1879	44	1879	35	1878	20	1881, 1883	1	1880	1	1880
45	1878	53	1880	53	1879	43	1876	29	1879	10	1875	-7	1880	-7	1880
37	1882	62	1876	61	1874	48	1876	29	1873	24	1873	7	1880	7	1880
46	1873	59	1876, 1882	52	1874	40	1873, 1879	30	1873, 1876, 1879	15	1880	-3	1880	-6	1881
47	1878	53	1879	53	1879	41	1875	23	1876	11	1875	-7	1880	-10	1875
31.3	1882	36.1	1881	39.5	1883	34.2	1883								
33	1882	46	1882	42	1883	27	1883	10	1880	-18	1880	-21	1880	-42	1883
27	1881	37	1874	34	1881	14	1873	6	1881	-31	1875	-50	1880	-50	1880
32	1876	43	1883	39	1875	10	1876	6	1874, 1878	-28	1875	-38	1879	-38	1879
47	1881	55	1883	55	1881	41.5	1883	35	1880	19	1880	-1	1883	-4	1882
38	1882	40	1883	39	1881	30	1881, 1882	19	1878	7	1880	-4	1879, 1882	-27	1883
44	1876	46	1874	47	1880	34	1879	25	1879	-2	1875	-12	1883	-13	1882
63	1877	68	1877	69	1881, 1879	57	1883	49	1879	30	1880	13	1880	13	1880, 1881
40.5	1879	47.5	1876	44	1880	35	1878	25	1876, 1879	2.5	1875	-9	1880	-13	1875
30	1883	40	1883	36	1883	18	1883	9	1881	-20	1881	-46	1879	-46	1879, 1883
50	1877	60	1883	57	1880	42	1876	24	1873	7	1872	-7	1872	-11	1875
52	1882	60	1881	60	1874, 1879, 1881	53	1880	39	1875, 1876, 1880	24	1880	7	1880	7	1880
47	1876	56	1880	55	1882	42	1871, 1875	31	1873	19	1875	2	1880	1	1879
65	1880	69	1881	69	1881	64	1880	49	1880	33	1881	23	1880	23	1880
60	1873, 1879	67	1876, 1881, 1882	62	1879	54	1879	39	1873	24	1873, 1881	13	1880	13	1880
52	1880	60	1882	56	1879	43	1879	30	1879	18	1880	-5	1880	-5	1880
51	1879	57.5	1882	57	1879	47	1879, 1880	35	1879, 1880	17	1883	3	1880	3	1880
28	1876	37.6	1882	34	1876	23	1878	-4	1878	-20	1875	-24	1879, 1880	-28	1875
40	1875	50	1873	51.4	1882	37	1872, 1876	25	1873	-2	1872	-23	1872	-23	1872
50.2	1883	50	1882	60	1880, 1881	46	1882	40	1880	18	1880	1	1880	1	1880
49	1877	58.2	1882	55	1872, 1875	41	1875	27	1873	5	1880	-8	1872	-10	1879
40	1879	49.6	1883	45.6	1876	38	1875	26	1876	Zero.	1880	-12	1872, 1880	-17	1873
48	1879, 1882, 1883	54	1882, 1883	50	1883	37	1879	23	1879	-5	1880	-12	1880	-20	1879

Table showing the lowest temperatures (in degrees Fahrenheit) recorded

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Concho, Fort, Tex .....	— 1	1881	6	1883	16	1880	29	1882	46	1878
Custer, Fort, Mont. ....	— 31	1881	— 38	1883	— 23	1880	12	1883	23	1883
Davenport, Iowa .....	— 23	1883	— 16	1875	— 6	1873	16	1881	29	1875
Davis, Fort, Tex .....	Zero.	1881	9	1883	17	1880	25	1882	40	1880
Dayton, Wash. T. ....	— 23.5	1883	— 24	1883	8	1880	21	1880	30	1881
Deadwood, Dak. ....	— 30	1883	— 32	1883	— 5	1879	11	1880, 1881	21	1883
Delaware Breakwater, Del .....	10	1882	7	1881	19	1883	25	1881	40	1880
Denver, Colo. ....	— 29	1875	— 22	1883	— 10	1880	4	1876	27	1872, 1873
Des Moines, Iowa .....	— 26	1883	— 23	1883	— 3	1880	11	1881	23	1882
Detroit, Mich. ....	— 15	1875, 1879	— 20	1875	— 7	1872	8	1875	29	1875
Dodge City, Kans. ....	— 20	1883	— 20	1883	— 8	1880	13	1881	24	1877
Dubuque, Iowa .....	— 23.2	1883	— 31	1875	— 10	1875	14	1875	27	1875
Duluth, Minn. ....	— 33	1875	— 34	1875	— 26	1875	3	1874, 1881	26	1876
Eastport, Me. ....	— 20	1874	— 20	1876	— 4	1883	2	1874	29	1882
Elliot, Fort, Tex .....	— 12	1883	— 10	1883	— 2	1880	20	1881	28	1882
El Paso, Tex. ....	5	1881	12	1881	21	1880	29	1882	41	1883
Erie, Pa. ....	— 15	1875	— 16	1875	2	1877, 1883	11	1881	33	1875, 1882, 1883
Esconaba, Mich. ....	— 26	1881	— 32	1875	— 20	1875	2	1883	20	1883
Fort Smith, Ark. ....	2.5	1883	8	1883	28	1883	37.2	1883	45	1883
Galveston, Tex. ....	20	1883	30	1883	34	1875	44	1873	54	1876
Grand Haven, Mich. ....	— 12	1873	— 24	1875	Zero.	1873, 1875	9	1874	28	1875
Grand Fork, Ariz. ....	10	1883	17	1883	21	1882	29	1879	37	1883
Hatteras, N. C. ....	22	1881	20	1781	32	1881, 1883	31	1881	47	1882
Helena, Mont. ....	— 24	1883	— 32	1883	— 2	1883	6	1881	25	1883
Huron, Dak. ....	— 30.3	1883	— 31.8	1883	— 7.8	1883	19.2	1882	28	1882
Indianapolis, Ind. ....	— 23	1879	— 8	1875	9	1877	19	1875	31	1877
Indianola, Tex. ....	15	1873	21.5	1883	32	1880	33	1875	51	1873
Jacksonville, Fla. ....	24	1873	32	1875, 1878	31	1873, 1876	37	1881	48	1877
Keokuk, Iowa. ....	— 20	1875, 1879	— 11	1873	— 2	1873	20	1875, 1881	29	1875
Key West, Fla. ....	48	1879	55	1872, 1877, 1878	53	1873	61	1873, 1881	63	1877
Kitty Hawk, N. C. ....	11	1879	11	1881	20	1876	29	1881	42	1876, 1877
Knoxville, Tenn. ....	— 14	1877	6	1873	6	1873	24	1875, 1881	37	1880
La Crosse, Wis. ....	— 43	1873	— 34	1875	— 23	1873	10	1881	29	1875
Leavenworth, Kans. ....	— 29	1873	— 12	1883	2	1876	13	1881	31	1875
Lewiston, Idaho. ....	— 14.2	1883	— 13.5	1883	12	1880	30	1880	35	1881
Little Rock, Ark. ....	12	1883	22	1881, 1883	32	1880, 1881	29	1881	44	1883
Los Angeles, Cal. ....	30	1880, 1883	28	1883	25.2	1882	39	1883	39.5	1883
Louisville, Ky. ....	— 10	1875, 1879	Zero.	1875	3	1873	21	1875	36	1875, 1876

at Signal Service stations for each month of the year, &amp;c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.
49	1879	60	1877, 1880	54	1880	45	1882	33	1878	12	1880	6	1880	— 1	1881
29	1883	41	1888	38	1883	29	1880	10	1879	—24	1880	—42	1880	—42	1880
43	1874,	52	1880,	48	1875	36	1879	18	1873	— 3	1875	—17	1872,	—23	1888
	1882		1883										1876		
49	1881	58	1881	47	1882	37	1883	30	1880	6	1880	1	1880	Zero.	1881
35.5	1883	37.4	1881	36	1883	29	1881	19	1881	5	1881	—17	1879	—24	1883
38	1880	42	1883, 1888	40	1882	29	1880, 1881	5	1880	—16	1880	—25	1878	—32	1883
50	1882	59	1882	60	1881	51	1882	38	1880	23	1880	1	1880	1	1880
37	1882	42	1878	44	1876	28	1878	1	1878	—18	1877	—25	1876	—29	1876
44	1882	53	1882	48	1879, 1888	34	1879	15	1878	Zero.	1880	—17	1880	—26	1882
38	1875	50	1873, 1882	45	1875	29.8	1883	32	1873	Zero.	1880	—24	1872	—24	1872
40	1879	50	1877	50	1880	30	1876	10	1878	— 7	1880	—15	1876	—20	1883
40	1877	50.4	1882	41	1875	33	1873	30	1873	— 9	1873	—19	1876, 1879	—31	1875
36	1875, 1876	46	1875	45	1876	30	1879, 1882	8	1878	—29	1875	—34	1879	—38	1875
30	1875	45	1882	45	1880	35	1876	24	1881	—13	1875	—20	1875	—20	1874, 1875, 1876
44	1880, 1883	49	1880	48	1880, 1882	37	1880	26	1880	— 5	1880	—10	1879	—12	1883
50	1881	56	1880	52	1880	42	1880	26	1882	11	1880	— 5	1880	— 5	1880
42	1879	52	1883	50	1883	40	1879	28	1876	6	1880	—11	1880	—16	1875
34	1875, 1879	42	1876	38	1875	26	1883	17	1878	— 9	1880	—23	1880	—32	1875
50	1882	61	1882	60	1882	39.6	1883	39.8	1883	22	1882	9.5	1882	2.5	1883
64	1877 1879	69	1880	70	1877, 1880, 1882	59	1875	43	1873	29	1880	18	1880	18	1880
40	1878, 1879	40	1873	42.5	1875	30	1879	26	1876	Zero.	1880	— 4	1876	—24	1875
51	1882	56	1880	55	1882	47	1881	33	1881	20	1880	18	1880	10	1883
60	1882	63	1881	64	1881	60	1882	48	1882	32	1881	8	1880	8	1880
31	1880	38	1880	34	1880	30	1880, 1882	10	1881	—17	1880, 1881	—40	1880	—40	1880
34	1883	46	1883	42.7	1883	28.2	1883	21	1881	— 6	1881	—20.5	1883	—31.8	1883
45	1877, 1882	53	1882	48	1876	35	1875	23	1878	— 5	1880	—15	1876	—22	1879
60	1877	68	1877	67	1880	60	1878	46	1873, 1880	22	1880	14	1880	14	1880
62	1875, 1879	68	1879	66	1874, 1875	56	1874	40	1873	30	1873	19	1880	19	1880
45	1877	56	1873, 1880, 1883	47	1875	39	1875, 1876, 1883	20	1878	— 3	1872	—22	1872	—22	1872
71.2	1882	72.7	1883	72	1882	71.5	1883	65	1873, 1876	52	1873	44	1876	44	1876
55	1877, 1878	62	1881, 1882	62	1879, 1881, 1882	53	1876	38	1876	23	1879	8	1880	8	1880
47	1878	53	1882	50	1879	40	1871	25	1876	11.5	1872	— 5	1880	—14	1877
40	1876	52	1883, 1880	44	1875	31	1873	18	1873	—21	1875	—37	1879	—43	1873
45	1877, 1882	53.5	1882	52	1871, 1876, 1880	37	1876	19	1873	Zero.	1872	—14	1880	—29	1871
43	1880	48	1880, 1881, 1882	45	1882	34	1883	28	1881	13	1880	—16	1879	—16	1879
56	1882	61	1882	60	1880, 1882	47	1881	39	1880	10	1880	6	1880	6	1880
67	1878	51.2	1881	50	1883	44	1880	42.5	1879	34.2	1881	30	1878, 1879	28	1883
48	1875	57	1882	58	1880	42	1875 1876	27	1878	4.5	1872	— 7	1880	—10	1875, 1879

Table showing the lowest temperatures (in degrees Fahrenheit) recorded

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Lynchburg, Va.....	- 4	1877	3	1875	17	1876	25	1881	37	1876
Mackinaw City, Mich.....	- 9	1883	-11	1883	- 0	1883	3	1883	28	1883
Macon, Fort, N. C.....	23	1883	20	1881	30.3	1883	30	1881	48	1882
Maginnis, Fort, Mont.....	-29	1883	-35	1883	- 1	1883	14	1888	19	1883
Marquette, Mich.....	-26	1881	-27	1875	-14	1875	3	1875	22	1875
Memphis, Tenn.....	2	1875	13	1875	18	1876	27	1881	41	1883
Milwaukee, Wis.....	-25	1875	-22	1875	- 3	1873, 1877	12	1875	26	1875
Mobile, Ala.....	15	1879	28	1875, 1876	31	1873, 1876	33	1881	47.3	1883
Montgomery, Ala.....	14	1873, 1879	23	1875	25	1873	30	1881	44	1883
Moorhead, Minn.....	-42	1883	-33	1881, 1883	-22	1883	-13	1881	26	1882
Mount Washington, N. H.....	-46	1875	-42	1876	-49	1872	-18	1874	- 1	1880
Nashville, Tenn.....	- 8	1877	0	1875, 1876	11	1873	26.5	1875	37	1877
New Haven, Conn.....	-14	1873	- 4	1881	3	1883	16	1874	30.5	1882
New London, Conn.....	-10	1882	- 6	1871	6	1883	19	1874	32	1876, 1882
New Orleans, La.....	20	1879	32.5	1875	36.5	1876	38	1881	56	1871, 1877
New York City.....	- 6	1875	- 4	1873	3	1872	30	1874	34	1876, 1880
Norfolk, Va.....	3	1879	9	1875	16	1872	27	1875, 1880	38	1876
North Platte, Nebr.....	-27	1881	-29	1883	-21	1880	12	1875	30	1875
Olympia, Wash. T.....	9	1883	8	1883	23	1880	28	1880	30	1882
Omaha, Nebr.....	-22.1	1883	-24.9	1883	- 7	1880	6	1881	28	1875
Oswego, N. Y.....	-13	1882	-10	1875	-11	1872	13	1874	31	1776
Palestine, Tex.....	7	1883	13.5	1883	34	1882, 1883	43.5	1882	50	1882
Pensacola, Fla.....	29	1881	31	1881	36	1881	34	1881	46.6	1883
Philadelphia, Pa.....	- 5	1875	- 1	1881, 1875	5	1873	17.5	1874	36	1880
Pike's Peak, Colo.....	-37	1883	-37	1875	-29	1875	-21	1875	- 8	1875
Pittsburg, Pa.....	-13	1875	-10	1875	2	1877	14	1875	27	1876
Port Huron, Mich.....	-14.7	1883	-20	1875	- 8	1875	7	1875	26.2	1883
Portland, Me.....	-11.5	1882	- 7	1874, 1876	- 7	1872	14	1874	34	1873, 1876
Portland, Oreg.....	3	1875	7	1883	25.5	1880	28	1875	33	1878
Prescott, Ariz.....	-17	1880	-11	1880	- 8	1876	18	1878	26	1877
Provincetown, Mass.....	3.5	1883	13.5	1883	7	1883	22	1882	34	1883
Red Bluff, Cal.....	19	1883	23	1883	23	1880	34.9	1883	37	1879
Rio Grande City, Tex.....	19	1881	33	1880	33	1880	43	1881	49	1877
Rochester, N. Y.....	-12	1873	-12	1875	- 7	1872	11	1879	28	1880
Roseburg, Oreg.....	12	1883	9.4	1883	19	1880	29	1878	33	1880
Sacramento, Cal.....	22	1883	22	1882	39	1880	39.8	1883	39	1880
Saint Louis, Mo.....	-16	1875	- 8	1875	8	1873, 1876	22	1875	32	1875

at Signal Service stations for each month of the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		On record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Date.
40	1880	55	1876, 1883	50	1874	40	1875, 1879	28	1879	13	1880	— 5	1880	— 5	1880
56.7	1883	46.8	1883	42.8	1883	34	1883	24	1883	8.4	1883	3.8	1883	—11	1882
57	1882	05	1881, 1883	03	1881, 1883	58	1882	47	1882	28	1881	17	1882	17	1882
13	1883	41	1882	30	1883	20	1882	23	1882	—16	1883	—14	1882, 1883	—85	1883
31	1881	40.3	1883	37	1879	28	1883	18	1878	— 9	1875	—20	1880	—27	1875
54	1879	00	1882	59	1880	44	1875	29	1878	16	1877, 1880	8	1876, 1880	2	1875
40	1875, 1879, 1882	50	1875, 1876, 1880, 1883	42	1875	32	1876	22	1878	— 5	1880	—21	1872, 1880	—25	1875
61	1879	03.8	1882	07	1879	53	1871	34	1873	27	1872, 1877, 1881	14	1880	14	1880
58	1877, 1879	00.8	1882	61.5	1879	51.5	1876	33	1873	21	1882	8	1880	8	1880
32	1883	43	1883	38	1882	17	1883	15	1883	—15	1881	—34	1883	—42	1883
15	1878, 1879	27	1883	20	1876	11	1879	— 3	1881	—40	1875	—47	1876	—49	1872
49	1877	50.3	1882	54.7	1883	41	1875	28	1873	13	1872	— 2	1876	— 8	1877
42	1876, 1881	51	1879	46	1880	35	1879	24	1879	2	1875	— 6	1883	—14	1873
43	1876	51	1879	48	1874	37	1879	27.2	1883	4	1875	— 7.5	1883	—10	1882
05	1879	00.8	1882	09	1879	58	1871	40	1873	31.5	1881	20	1870, 1880	20	1870, 1879, 1880
47	1878, 1879	37	1873 1882	53	1874	36	1872	31	1876	7	1875	— 6	1880	— 6	1875, 1880
53	1876	30	1876, 1877	58	1874	50.5	1875	31	1876	20	1872	6	1880	6	1880
33	1876	45	1877, 1882	42	1876	21	1876	11	1878	—10	1877	—27	1879	—29	1883
26	1880	40	1882	41	1880, 1882	31	1877	20	1881	21	1882	8	1879	8	1879, 1883
42	1877	51	1873	49	1877	30	1873	15	1878	— 6	1875	—17	1879	—24.9	1883
40.5	1875	49	1875	49	1875	36	1879	28	1879	— 1	1875	—14	1875	—14	1875
55	1882	03	1882	04	1882	49	1883	41	1882	26.5	1883	23	1882	7	1883
64	1881	04.2	1882	09	1881	57.3	1882	45	1880	28.1	1881	17	1880	17	1880
49	1873, 1878, 1879	56	1883	53	1872	43	1879	31	1873 1876	8	1875	— 5	1880	— 5	1875, 1880
2	1882	18	1876	15	1882	6	1876	—17	1878	—36	1880	—37	1878	—37	1878, 1875, 1882
36	1879	52	1874	49	1876	35	1879	28	1873, 1878, 1876	4	1880	— 9	1880	—12	1875
37	1877	48.9	1883	46	1873, 1879	31	1879	24	1879	— 6	1880	—14	1880	—20	1875
43	1875	51	1876, 1882	48	1774	37	1875	28	1876, 1879	— 6	1875	—17	1872	—17	1872
42	1880	46	1875, 1880	43	1876	39	1873, 1877, 1882	31	1877	22.5	1880	3	1879	3	1875, 1879
22	1880	42	1879	38	1876	29	1880	18	1880	— 1	1880	—18	1879	—18	1879
45.5	1882	52	1883	53	1883	43.5	1883	34.1	1883	22.8	1883	— 0.4	1883	— 0.4	1883
47	1880	53	1881	52	1881	50	1878, 1881, 1882	32	1881	26	1880	25	1878, 1879, 1882, 1884	19	1883
62	1877, 1883	63	1877, 1883	68	1879, 1883	53	1883	43	1878, 1879	30	1880	24	1880	19	1881
36	1879	48	1873	47	1882	34	1878, 1879	19	1879	1	1875	—11	1871	—12	1873, 1875
37.5	1880	40	1879	40.5	1882	34.6	1881	22.5	1881	17.5	1880	7	1879	7	1879
48	1881	51	1879	49	1880	44.4	1882	36.4	1881	27	1880	23.5	1878	22	1883
48	1877	57	1876	55	1879, 1880	40	1875	25	1878	5	1872	—17	1872	—17	1872

Table showing the lowest temperatures (in degrees Fahrenheit) recorded

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Saint Michael's, Fort, Alaska .....	-47	1878	-52	1878	-39	1878	-27	1880	-3	1876, 1879
Saint Paul, Minn. ....	-31	1883	-32	1875	-22.5	1873	7	1874	24	1875
Saint Vincent, Minn. ....	-44	1881, 1883	-38	1883	-31	1883	-14	1881	21	1882
Salt Lake City, Utah. ....	-20	1883	Zero.	1883	4	1874	19	1875	32	1880
San Diego, Cal. ....	32	1880	35	1880	38	1880	39	1875	45.4	1883
Sandusky, Ohio .....	-16.5	1879	Zero.	1881	10	1883	14	1881	34	1880
Sandy Hook, N. J. ....	-8	1879	Zero.	1881	10	1883	12	1874	33	1874
Sanford, Fla. ....	46	1883	50	1883	48	1883	53.4	1883	51	1883
San Francisco, Cal. ....	36	1876, 1883	35	1883	39	1880	40	1875	45	1876, 1880, 1882, 1877
Savannah, Ga. ....	18	1873	29	1875, 1876, 1881	27	1873	33	1881	48	1877
Shaw, Fort, Mont. ....	-33	1883	-37	1883	-18	1883	-4	1880	21	1881
Shreveport, La. ....	6	1879	23	1875, 1881	26	1876	33	1881	47	1876, 1877
Sill, Fort, Ind. Ter. ....	-9	1879	-3.5	1883	10	1880	26	1881	42.5	1883
Sitka, Alaska. ....	8.5	1883	4	1882	5.5	1882	25.5	1882	31	1881
Smithville, N. C. ....	16	1879	18	1881	21	1876	29	1881	41	1878
Spokane Falls, Wash. T. ....	-27.7	1883	-25.1	1883	7	1883	26	1881	29	1881
Springfield, Ill. ....	-10	1883	-2.4	1883	12.5	1883	19	1881	33.9	1883
Stockton, Fort, Tex. ....	2	1881	8	1883	15	1880	24.2	1882	41.6	1882
Thatcher's Island, Mass. ....	-8	1882	-4	1880, 1881	6.5	1883	18	1881	31	1880
Thomas, Camp, Ariz. ....	12.8	1883	16	1881	28	1881	24.3	1883	37.8	1883
Toledo, Ohio. ....	-14	1873	-12	1875	-3	1873	12	1875	30	1876
Unalaksha, Alaska. ....	19	1880, 1883	7	1879	5	1883	18	1883	24	1882
Verde, Fort, Ariz. ....	1.4	1883	10	1880	11	1881	27	1883	37	1880
Vicksburg, Miss. ....	10	1875	21	1875	27	1876	31	1881	46	1877
Washington City. ....	-14	1881	-1.5	1875	4	1873	22.5	1875	33.5	1876
West Las Animas, Colo. ....	-21.5	1883	-22.5	1883	6	1882	19	1882	30.5	1883
Wilmington, N. C. ....	16	1879	15	1875	20	1873	28	1875	38	1876
Yankton, Dak. ....	-32	1881	-23	1881	-16	1876, 1880	-3	1881	24	1875
Yuma, Ariz. ....	22.5	1883	25	1880	31	1881	40	1878	49	1883

at Signal Service stations for each month of the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Year.	o	Date.
22	1881	33	1881	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
30	1876, 1877	46	1873	43	1875	30	1873	15	1873	-24.5	1875	-39	1879	-39	1879
29	1883	40	1881, 1883	36	1881	17	1883	11	1883	-22	1880, 1883	-42	1880	-44	1881, 1883
37	1875	45	1880	44	1880	26	1881	22	1878	8	1880	-10	1879	-20	1885
51	1878	54	1880	54	1879	49.5	1883	44	1878	38	1881	32	1879	32	1879, 1880
47	1879, 1882	56	1880	48.5	1882	42	1879	30	1878, 1880	Zero.	1880	-13	1880	-16.5	1879
49	1874	50	1880	55	1874	46	1875	33	1876	8	1875	-5	1880	-5.6	1880
71	1883	70	1883	69	1883	63.5	1882	62	1883	50.5	1883	36	1883	36	1883
48	1871, 1874	49	1874, 1881	50	1875, 1879, 1882	50	1874, 1880, 1881, 1882	45	1881	41	1880	34	1879	34	1879
59	1877	66	1876	63	1879	54	1871	37	1878	22	1872	15	1880	15	1880
36	1883	37	1882	33	1883	23.5	1880	-2	1881	-26.5	1880	-42	1880	-42	1880
53	1877	64	1877, 1880, 1882	58	1880	47	1881	31	1873	18	1880	10	1880	6	1879
47	1879	56	1877, 1880	53	1880	44	1878	25	1878	-4	1880	2	1879, 1880	-9	1879
28	1882, 1883	43	1881, 1882	42.5	1883	54.5	1882	28	1883	5	1883	9	1882	4	1882
53	1878, 1879	61	1881	58	1883	49	1879, 1880	35	1876	23	1879, 1881	10	1880	10	1880
39	1882	43	1881	38	1881, 1882	31	1881	18	1881	3	1881	2.2	1882	-27.7	1883
48.7	1882	54	1888	52	1880	38	1879	26	1880	6	1880	-14	1880	-14.0	1880
46	1877	50	1877	51	1882	40	1883	29	1877	12	1880	8	1880	2	1881
40.1	1881	50	1879	45.5	1883	39.5	1883	28	1879	9	1880	-7	1880	-8	1882
45	1880	52	1880	49	1880	43	1880	26	1880	16	1880	18	1880	12.8	1883
43	1873, 1875, 1878, 1879	50	1888	47	1879	36	1871	25	1876	5	1880	-15	1872	-15	1872
34	1882	37	1881	36	1882	33	1883	24	1879	19	1883	12	1882	5	1883
45	1880	48	1879	51	1880	34	1881	27.3	1881	8	1880	6	1879	1.4	1883
53	1879	62	1881	62	1879	48	1871	34	1873	23	1877, 1880	12	1880	10	1875
48.5	1873	57	1871	50	1874	38	1879	26	1873	12.5	1880	-13	1880	-14	1881
40.5	1883	52	1882	49.5	1882	35	1883	19	1883	-1	1882	-6.5	1882	-22.5	1883
52	1878	62	1881	56	1874	47	1879	32	1876	20	1872	10	1880	10	1880
28	1876, 1877, 1879	44	1877	45	1875	26	1876	9	1878	-15	1875	-34	1879	-34	1879
56	1878	61	1879	64	1879	50	1882	41.4	1883	31	1880	27	1879	22.5	1883



## APPENDIX 40.

Table showing the means of the daily maximum and minimum temperatures (in degrees Fahrenheit) ending June

[The means are obtained by dividing the sum of the daily readings of the maximum

Stations.	1883.									
	July.		August.		September.		October.		November.	
	Mean.		Mean.		Mean.		Mean.		Mean.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°
Albany, N. Y.	81.0	64.1	78.1	60.6	69.2	52.2	58.1	43.1	50.7	37.3
Alpena, Mich.	71.5	54.8	71.9	51.0	61.5	43.9	49.7	35.1	40.6	26.8
Apache, Fort, Ariz.	87.4	57.8	86.3	56.7	84.6	47.3	68.7	36.2	61.9	22.5
Assinaboine, Fort, Mont.	81.3	52.1	79.6	54.3	67.9	42.2	47.7	31.1	37.0	15.4
Atlanta, Ga.	89.4	70.8	85.0	67.4	79.9	62.7	74.4	57.7	61.8	45.4
Atlantic City, N. J.	80.0	65.6	76.6	63.3	71.1	57.9	60.9	48.8	52.8	38.4
Augusta, Ga.	93.0	74.8	89.0	71.8	83.5	65.5	77.3	60.6	67.0	48.6
Baltimore, Md.	85.4	68.5	80.7	63.0	72.2	58.0	63.8	51.4	54.9	41.7
Barneget City, N. J.	79.4	66.3	75.4	64.6	69.8	58.0	60.0	50.1	53.4	40.3
Bennett, Fort, Dak.	84.5	58.9	85.1	57.6	74.1	46.6	54.0	32.8	47.3	16.0
Benton, Fort, Mont.	80.7	51.5	81.6	53.6	70.6	42.6	51.2	32.0	40.8	18.8
Bismarck, Dak.	79.5	55.8	78.6	54.8	69.4	43.7	48.3	33.4	38.7	15.0
Block Island, R. I.	75.5	63.4	72.6	61.3	66.5	55.0	57.6	46.2	53.6	39.6
Boise City, Idaho.	79.9	52.6	89.7	57.5	81.3	46.0	56.3	35.4	52.3	28.6
Boston, Mass.	82.2	61.2	78.0	58.6	68.4	51.1	56.2	39.2	51.8	33.9
Brownsville, Tex.	93.9	75.0	96.4	75.1	87.8	70.0	87.9	71.6	77.7	63.1
Buffalo, N. Y.	72.8	60.7	72.8	58.8	66.4	49.3	55.3	41.4	51.5	35.4
Burford, Fort, Dak.	83.4	52.1	81.6	53.2	70.9	40.0	49.3	30.8	35.1	9.7
Cañero, Ill.	85.3	70.2	82.6	67.2	77.1	59.6	67.2	53.7	58.5	42.4
Canby, Fort, Wash.			( <sup>1</sup> )		66.5	55.1	55.2	46.9	50.6	43.7
Cape Henry, Va.	85.8	69.9	82.0	60.2	76.4	65.0	68.2	57.3	61.3	44.9
Cape May, N. J.	79.9	68.4	78.4	65.7	72.4	59.2	63.2	49.8	54.6	41.0
Cape Mendocino, Cal.	58.6	47.5	60.3	49.2	67.6	52.9	58.1	48.0	55.9	45.6
Cedar Key, Fla.	89.8	77.9	90.5	77.2	87.0	72.6	82.0	70.2	72.8	58.1
Charleston, S. C.	92.1	76.6	87.8	73.7	81.4	68.5	78.0	63.5	66.8	53.1
Charlotte, N. C.	89.0	71.2	84.9	68.9	76.9	61.8	69.7	55.1	62.4	43.7
Chattanooga, Tenn.	90.4	68.5	84.6	67.0	81.1	62.2	72.1	58.0	61.0	43.1
Cheyenne, Wyo.	81.0	51.9	81.6	51.5	72.8	43.4	51.3	30.4	51.0	27.2
Chicago, Ill.	78.9	62.4	74.0	61.7	66.6	54.5	57.8	46.8	49.9	34.4
Chincoteague, Va.	82.2	67.5	78.4	66.1	73.0	61.6	64.9	53.0	56.7	41.8
Cincinnati, Ohio.	85.0	68.9	81.2	65.4	75.0	58.5	65.3	53.2	56.3	41.3
Cleveland, Ohio.	78.1	62.6	75.3	59.0	68.2	51.5	59.5	45.6	51.7	35.7
Columbus, Ohio.	83.6	64.6	80.1	60.2	74.0	54.0	62.8	48.3	52.5	36.9
Concho, Fort, Tex.	94.9	71.2	98.0	70.5	86.0	62.1	78.1	57.8	67.6	44.6
Custer, Fort, Mont.	( <sup>1</sup> )	( <sup>1</sup> )	88.7	53.3	80.9	43.6	56.9	31.8	46.5	18.9
Davenport, Iowa.	82.0	62.8	78.1	58.3	71.2	48.2	56.9	40.5	50.5	29.3
Davis, Fort, Tex.	88.9	62.3	89.9	60.7	81.4	54.4	76.5	50.6	63.8	38.9
Dayton, Wash. T.	87.3	53.6	85.1	53.2	77.5	45.2	57.8	34.7	51.6	33.3
Deadwood, Dak.	73.1	58.5	75.4	54.3	63.8	45.5	47.4	33.9	44.5	23.0
Delaware Breakwater, Del.	81.0	68.4	78.1	65.5	71.7	61.7	68.6	53.6	55.3	42.8
Denver, Colo.	82.6	58.7	83.6	58.8	74.7	50.2	57.6	36.4	56.1	31.1
Des Moines, Iowa.	85.6	65.2	80.9	60.8	70.7	50.2	58.6	41.6	48.9	28.2
Detroit, Mich.	80.3	61.3	77.1	57.0	68.2	50.2	58.0	44.6	51.7	38.9
Dodge City, Kans.	88.4	66.4	82.5	63.4	76.4	54.0	50.2	42.0	55.8	28.1
Dubuque, Iowa.	82.6	62.5	78.6	58.0	69.8	48.1	55.9	42.7	47.6	30.2
Duluth, Minn.	74.2	57.1	69.6	56.0	62.4	48.1	49.8	38.6	37.2	20.8
Eastport, Me.	67.8	63.6	70.9	53.8	63.0	48.3	50.3	39.2	45.0	32.6
Elliot, Fort, Tex.	88.9	64.8	86.8	64.8	( <sup>1</sup> )	55.8	62.3	44.3	61.7	33.4
El Paso, Tex.	90.8	67.5	96.0	67.3	86.5	58.4	76.4	49.2	65.5	37.9
Erie, Pa.	77.2	63.4	75.6	60.7	67.5	52.3	59.4	44.2	50.2	37.8
Escanaba, Mich.	71.7	54.5	71.3	51.5	62.2	43.6	50.8	36.9	40.8	24.8
Fort Smith, Ark.	94.4	71.1	92.4	68.7	86.8	59.6	74.9	50.9	66.2	43.4
Galveston, Tex.	89.8	78.5	90.9	79.7	84.8	74.8	82.0	72.7	70.5	58.9
Grand Haven, Mich.	72.9	60.9	71.0	57.0	64.3	49.4	53.3	41.2	47.9	32.9
Grant, Fort, Ariz.	87.4	65.6	85.5	64.9	82.9	61.8	69.9	48.7	61.1	46.4
Hatteras, N. C.	85.1	73.5	82.8	71.9	78.0	68.9	70.3	60.1	63.1	48.7

<sup>1</sup>Sixteen days only.

<sup>2</sup>Observations began September 1, 1883.

## APPENDIX 40.

(*ranked*) at stations of the Signal Service, United States Army, for each month of the year 30, 1884.

and minimum self-registering thermometers by the number of days in the month.]

1883.		1884.											
December.		January.		February.		March.		April.		May.		June.	
Mean.		Mean.		Mean.		Mean.		Mean.		Mean.		Mean.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
37.4	30.4	31.1	14.8	38.9	25.6	41.6	30.1	54.2	40.3	60.9	50.8	81.3	61.3
30.4	17.7	20.3	5.0	22.6	7.2	32.3	14.8	45.4	30.5	57.8	40.7	70.9	52.9
52.2	27.1	51.1	21.0	52.9	23.3	56.4	31.3	61.9	32.0	75.3	39.5	85.6	45.7
31.0	14.0	22.0	1.8	12.2	- 6.2	36.4	11.2	54.0	29.4	71.1	42.8	78.0	53.8
56.8	39.2	44.8	26.8	60.3	43.1	62.3	46.4	66.5	50.3	79.1	62.3	78.1	64.0
43.4	20.8	35.8	21.7	43.1	31.2	43.0	32.4	54.2	40.0	60.7	51.5	72.4	59.8
63.1	44.0	52.3	34.6	67.9	46.4	68.8	50.5	71.7	52.4	84.0	65.0	82.3	67.2
44.9	32.7	39.0	25.0	48.6	34.7	50.2	37.4	59.8	43.2	72.8	56.9	81.8	64.4
44.3	30.9	36.0	22.0	44.6	34.0	45.9	( <sup>1</sup> )	53.8	41.5	66.6	51.6	72.8	58.9
34.1	7.8	24.8	- 1.8	17.2	- 6.2	39.4	17.0	54.7	31.9	71.4	44.7	85.6	50.7
39.0	17.3	27.2	6.8	19.6	- 1.9	44.6	25.8	56.0	30.4	73.7	40.2	81.3	51.9
25.0	4.5	14.5	- 7.6	8.9	- 9.8	29.9	10.5	47.6	30.2	67.1	44.1	81.2	54.8
43.4	28.1	37.1	23.2	42.6	28.0	42.7	30.3	48.9	38.0	59.9	47.0	68.9	53.0
( <sup>1</sup> )	( <sup>1</sup> )	42.4	15.8	30.5	22.0	52.3	36.3	62.1	42.6	72.7	50.2	79.3	57.0
37.3	20.9	32.0	16.3	39.1	23.1	42.2	26.2	50.8	36.7	64.2	45.6	77.9	56.6
69.5	55.8	63.8	44.2	75.6	56.7	79.7	62.0	82.8	64.1	87.0	69.8	89.9	73.0
41.5	25.2	32.2	10.6	36.3	18.4	36.8	22.4	47.9	32.7	60.8	44.7	75.4	58.0
20.0	- 1.2	17.1	- 6.6	9.4	- 11.2	31.6	10.4	52.4	29.2	72.2	43.5	86.3	50.6
51.2	33.9	35.4	19.2	49.5	33.8	54.5	41.0	63.6	49.8	74.1	59.0	80.9	67.4
48.3	40.2	46.6	38.2	44.6	33.0	50.1	39.9	56.8	45.9	69.5	48.5	60.8	51.3
52.7	37.9	44.6	26.5	55.6	38.9	54.9	39.2	59.5	44.0	73.5	58.2	79.2	64.6
45.4	32.4	33.0	24.4	45.4	32.7	45.5	34.0	54.1	41.8	66.2	53.0	74.5	60.9
55.3	43.6	53.0	43.5	51.6	40.3	53.7	41.7	54.2	43.8	58.2	47.2	60.4	49.5
68.9	55.5	50.2	44.1	60.8	57.2	73.1	60.8	75.0	62.7	82.7	70.5	84.7	71.2
63.8	49.0	54.9	38.6	67.0	52.0	67.7	53.7	70.8	56.2	82.1	69.0	81.6	69.7
55.0	39.2	46.8	30.5	60.7	42.6	62.6	45.2	66.7	47.8	78.9	60.2	78.8	62.0
54.4	37.4	43.5	26.0	57.1	41.4	62.0	44.9	66.6	49.0	79.5	60.0	80.9	64.9
40.5	18.4	32.8	12.8	38.6	13.6	41.8	21.2	49.4	26.9	64.7	38.6	78.2	49.1
28.5	23.4	26.5	11.1	35.4	20.3	41.1	27.3	50.7	37.9	63.9	48.3	71.1	57.3
47.5	32.6	36.2	25.2	48.9	35.0	49.0	35.3	55.5	41.6	70.0	53.5	77.8	61.5
46.9	32.0	33.9	18.4	50.0	33.8	51.8	39.1	60.0	46.2	71.7	57.3	82.1	67.9
39.9	25.2	27.0	10.5	39.7	22.9	40.9	26.0	51.6	36.5	66.4	49.2	70.5	59.3
41.9	27.6	27.7	12.2	44.9	29.5	46.4	32.0	58.2	40.5	70.9	52.5	82.6	63.2
59.9	37.7	50.3	27.0	62.2	35.9	73.8	44.0	75.5	46.8	81.7	56.0	91.8	64.8
37.8	14.7	36.6	2.8	16.9	- 2.8	36.8	15.9	57.3	31.3	70.5	41.5	82.6	53.7
40.2	19.1	27.2	5.3	35.6	13.1	44.7	22.8	59.4	26.4	69.9	48.2	79.0	58.0
58.2	34.6	62.5	26.5	65.0	38.3	67.7	41.9	68.5	42.8	79.6	49.7	87.4	60.3
40.2	26.0	37.0	23.1	33.7	14.9	50.6	31.7	64.6	39.8	75.1	45.3	78.8	52.1
23.8	18.5	31.0	11.5	24.9	4.8	35.6	19.6	43.0	29.6	59.5	40.0	73.7	54.8
45.5	32.9	37.5	23.1	46.9	31.0	47.0	34.6	53.0	42.1	66.0	53.7	73.5	61.5
42.3	23.5	43.4	20.0	40.8	19.4	49.5	28.9	53.5	32.4	65.5	43.0	78.6	54.3
26.8	17.4	25.7	5.3	30.8	10.8	43.0	25.7	58.2	30.6	71.5	50.2	81.2	61.3
40.6	26.0	27.9	13.1	38.7	22.6	42.4	27.5	55.3	37.2	68.8	49.5	80.5	60.4
45.2	24.3	37.4	11.4	39.4	16.6	55.0	29.3	62.5	37.1	71.3	48.2	82.2	60.7
48.6	18.6	23.0	4.5	31.0	12.4	40.5	23.7	59.1	37.7	71.0	49.8	80.2	59.0
23.8	7.1	15.2	- 6.3	15.1	- 2.5	30.0	11.3	41.7	31.2	58.3	40.8	65.3	50.4
81.7	15.1	24.9	10.1	31.9	17.1	34.2	21.9	45.0	34.6	58.6	49.6	66.3	48.4
32.2	27.4	44.0	19.3	49.6	24.3	60.4	33.0	67.2	39.6	75.5	50.9	84.5	62.1
50.3	34.5	53.8	26.5	64.4	39.5	70.6	41.5	78.4	46.0	91.0	54.5	100.7	64.8
30.2	26.6	27.9	12.4	39.7	22.4	41.8	25.9	50.2	35.2	66.8	48.3	77.8	59.8
26.6	12.3	18.3	- 0.3	19.2	- 0.2	32.0	9.3	44.8	28.3	57.8	41.3	71.7	53.5
53.7	36.4	42.4	20.4	53.2	33.0	64.7	43.6	70.1	48.9	81.1	58.9	89.5	67.0
53.7	36.4	42.4	20.4	53.2	33.0	64.7	43.6	70.1	48.9	81.1	58.9	89.5	67.0
28.7	27.7	12.6		32.1	17.3	39.8	24.8	51.6	36.4	62.1	47.3	75.2	59.0
16.9	32.3	32.7		54.5	38.3	58.2	40.0	65.5	44.7	75.7	54.8	87.1	65.7
34.1	50.1	34.5		61.4	46.3	59.8	46.2	60.6	48.8	73.5	61.7	77.6	66.9

<sup>1</sup> No record.

Table showing the means of the daily maximum and minimum temperatures

Stations.	1883.									
	July.		August.		September.		October.		November.	
	Mean.		Mean.		Mean.		Mean.		Mean.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Helena, Mont.	77.5	53.5	77.5	56.3	69.3	48.2	45.8	33.7	41.7	24.2
Huron, Dak.	81.5	58.2	79.3	56.5	69.1	45.8	43.4	35.4	45.6	18.3
Indianapolis, Ind.	83.4	63.7	78.9	60.8	72.9	54.0	61.0	48.2	52.7	37.1
Indianola, Tex.	90.4	77.3	92.4	77.9	88.8	72.4	83.1	71.4	72.3	59.9
Jacksonville, Fla.	92.2	76.7	89.7	73.0	84.6	69.9	81.9	66.8	71.8	56.4
Keokuk, Iowa	84.4	66.4	79.8	61.8	73.8	53.1	58.5	44.6	52.0	34.1
Koy West, Fla.	91.8	79.0	91.2	78.9	88.7	78.1	84.4	75.9	79.0	72.4
Kitty Hawk, N. C.	86.6	72.1	80.4	70.5	76.8	67.0	68.5	59.8	61.7	46.9
Knoxville, Tenn.	87.0	66.9	84.9	64.8	81.9	59.6	72.5	53.2	59.6	38.7
La Crosse, Wis.	79.0	64.2	75.7	59.6	64.9	50.1	53.1	40.7	45.4	27.8
Leavenworth, Kans.	86.5	67.5	82.9	63.0	74.9	53.0	62.3	43.2	54.8	33.9
Lewiston, Idaho	90.0	59.1	87.1	57.6	76.0	47.7	57.9	39.5	57.6	35.5
Little Rock, Ark.	90.8	71.2	87.7	69.1	82.2	60.0	74.7	59.9	64.9	47.6
Los Angeles, Cal.	85.0	60.1	86.3	58.1	87.1	60.1	72.8	51.1	72.2	47.0
Louisville, Ky.	86.6	68.5	82.8	64.6	79.0	58.4	67.8	52.7	57.9	41.5
Lynchburg, Va.	87.9	68.2	84.6	64.0	75.4	58.6	66.3	52.1	58.4	39.7
Mackinaw City, Mich.	70.4	54.4	70.3	53.9	60.9	46.9	50.0	38.3	42.2	28.0
Macon, Fort, N. C.	85.2	74.1	83.4	71.8	77.1	68.0	60.8	60.1	62.2	48.8
Maginnia, Fort, Mont.	73.5	54.4	77.2	49.6	69.0	41.2	47.5	27.4	39.1	17.0
Marquette, Mich.	71.1	53.1	70.9	51.6	63.6	45.5	50.2	36.7	41.4	24.2
Memphis, Tenn.	89.8	71.4	86.2	68.5	79.7	61.1	72.5	56.2	62.7	45.6
Milwaukee, Wis.	76.4	50.3	73.8	54.5	64.3	50.2	53.7	42.8	46.6	30.4
Mobile, Ala.	96.7	75.6	98.5	74.3	88.4	69.3	82.5	65.7	69.1	56.8
Montgomery, Ala.	94.2	74.2	91.4	71.8	87.2	68.5	81.7	62.7	68.4	49.0
Moorhead, Minn.	78.1	52.6	75.2	51.2	66.5	42.3	48.4	32.4	35.4	11.7
Mount Washington, N. H.	51.9	40.3	49.2	37.8	46.0	31.3	35.6	22.4	27.4	11.4
Nashville, Tenn.	86.4	68.9	83.5	66.7	79.6	60.1	70.8	56.4	60.8	41.9
New Haven, Conn.	80.3	62.4	77.6	57.9	70.4	50.6	58.4	40.4	50.5	34.1
New London, Conn.	79.2	62.0	76.0	58.3	69.2	51.0	58.2	40.7	52.0	34.6
New Orleans, La.	90.3	77.0	89.9	76.8	86.0	72.5	81.5	68.4	70.5	55.6
New York City.	81.4	66.3	79.1	63.5	70.8	56.2	61.2	46.6	52.1	37.8
Norfolk, Va.	87.9	71.1	82.4	68.9	76.4	63.8	68.4	56.7	62.2	45.0
North Platte, Nebr.	84.9	62.7	86.8	59.9	72.3	50.0	58.5	37.0	52.3	27.4
Olympia, Wash. T.	76.1	48.2	71.3	55.1	67.0	48.1	57.3	43.9	50.2	41.9
Omaha, Nebr.	86.1	67.0	81.0	63.1	70.3	52.8	57.3	42.3	51.5	28.2
Oswego, N. Y.	78.7	60.3	75.5	59.8	67.1	50.8	43.4	38.7	50.1	35.1
Palo-tine, Tex.	92.9	73.0	93.0	71.6	86.0	65.0	78.4	61.6	68.4	51.3
Pensacola, Fla.	90.0	76.2	89.5	74.9	85.7	70.5	81.6	66.4	70.0	54.3
Philadelphia, Pa.	84.3	68.4	79.7	65.1	72.5	57.8	62.7	49.2	54.5	41.8
Pike's Peak, Colo.	47.0	34.0	46.2	33.9	36.7	24.6	22.2	10.4	18.6	7.9
Pittsburg, Pa.	84.4	63.6	80.9	59.9	74.0	58.5	63.7	47.5	55.3	38.0
Poplar River, Mont.	( <sup>1</sup> )	( <sup>1</sup> )	79.4	51.2	73.0	43.4	( <sup>1</sup> )	( <sup>1</sup> )	34.7	9.5
Port Huron, Mich.	76.2	58.2	74.7	55.9	65.7	49.2	54.7	40.6	44.9	31.9
Portland, Me.	79.0	61.7	76.5	60.0	67.2	51.1	55.8	40.4	48.9	34.4
Portland, Oreg.	80.0	57.0	73.8	54.2	72.3	52.6	58.4	45.8	52.8	42.0
Prescott, Ariz.	85.8	59.7	86.1	59.0	84.3	48.3	65.5	36.4	60.5	25.8
Provincetown, Mass.	79.7	61.1	76.8	60.7	67.8	58.0	55.8	43.3	50.1	37.5
Red Bluff, Cal.	98.4	67.3	94.0	62.7	89.6	61.4	68.3	49.3	61.7	41.4
Rio Grande City, Tex.	97.2	75.0	101.5	72.9	92.9	66.7	90.8	70.9	78.3	60.6
Rochester, N. Y.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	55.5	41.2	48.4	33.9
Roeburg, Oreg.	82.4	52.1	75.9	52.2	73.6	48.6	58.0	43.6	51.5	38.8
Sacramento, Cal.	90.6	60.7	88.9	59.2	87.3	59.6	89.5	48.4	62.1	40.1
Saint Louis, Mo.	87.2	68.3	84.1	65.2	78.6	57.4	63.2	50.0	59.3	41.6
Saint Michael's, Fort, Alaska	57.3	45.2	54.3	45.2	48.8	41.1	37.6	26.4	19.1	5.0
Saint Paul, Minn.	81.5	63.0	77.7	58.4	67.5	47.9	53.6	38.9	43.7	22.5
Saint Vincent, Minn.	74.6	50.2	72.4	50.1	65.1	40.2	47.7	26.4	28.6	8.6
Salt Lake City, Utah	87.3	65.4	86.7	66.8	79.3	60.1	54.3	38.7	47.1	31.3
San Diego, Cal.	75.5	64.0	75.9	63.5	78.2	63.9	69.0	54.7	67.7	50.2
Sandusky, Ohio	( <sup>4</sup> )	( <sup>4</sup> )	77.1	62.8	69.2	55.8	59.5	47.3	52.5	37.2
Sandy Hook, N. J.	83.3	67.6	79.5	64.8	70.7	56.3	60.3	46.5	52.1	40.0
Sanford, Fla.	94.2	75.1	91.0	74.2	86.0	71.5	82.2	69.7	75.0	61.2
San Francisco, Cal.	64.5	55.0	64.4	53.9	59.3	53.3	62.9	52.9	56.8	48.4
Savannah, Ga.	92.1	77.3	88.0	74.0	82.1	66.1	77.3	62.4	69.3	51.6
Shaw, Fort, Mont.	79.3	47.2	79.5	48.7	69.7	40.6	44.8	35.3	38.8	18.6
Shreveport, La.	97.2	74.1	95.1	71.1	88.6	63.2	81.4	63.5	69.8	49.5
Sitka, Alaska	57.9	48.1	59.3	48.8	58.9	48.5	50.6	41.0	38.6	27.3
Smithville, N. C.	87.2	75.2	84.6	71.7	78.4	66.7	73.7	59.8	69.5	48.4
Spokane Falls, Wash. T.	85.0	58.4	83.2	52.5	72.4	44.3	53.7	35.0	46.6	32.0

<sup>1</sup> No record.<sup>2</sup> Station closed April 1, 1884.

# REPORT OF THE CHIEF SIGNAL OFFICER.

(in Degrees Fahrenheit) at stations of the Signal Service, &c.—Continued.

		1884.									
		January.		February.		March.		April.		May.	
		Mean.		Mean.		Mean.		Mean.		Mean.	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1883	1884										
21.9	24.8	10.1	22.4	7.3	27.6	22.6	51.4	38.8	65.5	4	4
7.0	21.2	5.3	17.2	7.8	27.1	16.1	52.9	32.7	69.5	4	4
26.3	28.8	18.5	42.8	27.1	48.4	33.8	58.5	42.6	71.0	5	5
52.9	55.1	37.8	68.2	52.7	72.5	56.2	75.1	61.7	82.4	6	6
52.6	61.0	43.1	71.7	54.5	75.8	58.8	77.1	60.6	85.2	6	6
23.1	27.4	10.5	36.8	19.4	45.3	26.1	59.6	41.9	71.6	5	5
68.3	73.4	64.2	78.2	60.0	80.8	70.1	82.0	71.7	87.4	7	7
40.7	45.8	31.2	58.8	41.3	57.1	41.3	58.2	45.8	74.2	5	5
32.2	39.7	21.2	55.9	39.0	59.1	40.2	65.1	45.7	77.8	5	5
16.7	20.0	1.9	26.0	8.7	36.4	21.1	54.5	38.2	67.6	5	5
24.7	30.2	12.5	37.8	19.5	51.3	32.8	60.7	42.6	72.8	5	5
22.8	39.1	25.9	35.1	18.8	53.6	34.7	60.6	42.1	79.3	4	4
40.2	44.0	27.3	57.0	38.7	63.4	45.9	69.5	51.9	78.9	6	6
45.1	44.4	42.9	63.7	47.1	63.5	47.4	68.4	49.1	72.7	5	5
82.8	35.5	19.0	51.9	34.1	64.2	39.9	62.7	47.6	75.8	5	5
18.8	40.9	24.8	53.7	36.4	56.1	38.7	63.1	45.2	77.2	5	5
32.1	40.9	4.2	20.6	2.6	31.6	12.6	44.6	29.4	55.2	4	4
43.0	47.9	32.9	59.4	45.8	60.3	48.1	63.1	50.2	74.1	6	6
18.9	29.1	12.0	18.8	3.0	34.6	18.9	46.7	27.9	62.7	3	3
12.7	41.2	0.5	20.3	0.6	32.0	9.1	42.9	25.3	54.6	3	3
39.6	20.2	25.0	57.1	39.6	61.1	45.1	68.0	51.8	78.4	6	6
19.5	52.7	5.3	29.9	13.5	36.3	22.4	47.8	35.4	62.6	4	4
46.5	31.7	34.3	66.2	49.7	71.0	54.4	76.4	58.5	88.1	6	6
44.4	50.0	16.1	65.9	46.2	68.9	50.9	73.0	54.2	85.2	6	6
5.6	9.0	5.1	7.6	15.2	26.5	4.0	49.0	30.5	67.0	4	4
3.0	14.5	5.1	28.5	2.1	19.8	2.5	30.6	18.1	38.2	2	2
35.1	39.4	21.5	54.9	38.0	57.4	42.1	65.5	48.3	77.7	5	5
21.5	32.6	15.8	40.8	24.3	42.4	26.6	54.1	37.2	65.8	4	4
21.9	33.5	19.7	41.0	29.7	43.5	29.4	53.8	38.1	65.1	4	4
52.4	56.1	37.8	68.7	52.6	71.4	57.8	74.5	61.0	81.9	6	6
26.9	32.9	19.7	42.2	27.8	44.4	31.1	56.6	40.6	68.0	5	5
38.8	46.7	29.9	59.0	41.0	58.1	42.1	61.9	47.0	76.9	5	5
20.2	32.7	8.9	31.6	9.4	45.0	25.4	54.9	36.3	69.1	4	4
35.4	44.7	35.2	42.1	27.5	52.5	34.4	61.7	41.6	70.1	4	4
18.9	26.9	6.1	29.8	8.2	45.5	26.0	56.5	39.2	72.3	5	5
22.0	50.1	13.5	63.0	43.1	70.2	50.9	71.9	53.6	79.3	6	6
45.2	50.1	37.0	67.6	51.9	70.2	56.4	74.2	59.6	81.9	6	6
50.1	56.1	23.5	47.4	32.8	48.3	35.4	57.3	40.9	71.0	5	5
31.8	36.8	4.6	8.0	4.0	10.6	0.8	14.2	2.8	20.8	1	1
2.2	7.8	15.2	50.8	30.8	48.9	32.3	59.8	41.0	74.8	5	5
28.1	32.7	9.9	4.7	14.9	(1)	(1)	49.7	29.0	70.0	4	4
12.9	12.8	7.6	32.0	16.4	36.5	22.0	47.0	33.3	68.3	4	4
19.6	23.7	13.3	37.1	21.6	41.2	25.7	52.5	38.3	61.7	4	4
19.2	26.5	25.8	44.4	29.4	55.6	37.8	65.1	45.3	73.6	4	4
50.9	49.8	25.8	49.8	28.9	52.1	31.9	68.4	34.4	69.6	4	4
51.4	40.3	22.7	40.3	27.5	41.1	28.7	(7)	(7)			
21.7	36.8	38.2	55.4	36.8	60.8	43.1	66.6	47.2	79.9	5	5
21.4	35.9	40.5	80.2	55.5	85.6	62.4	88.7	65.0	93.5	7	7
21.4	51.6	10.6	35.5	18.5	37.6	23.8	48.2	33.9	63.7	4	4
21.4	35.1	34.0	47.4	30.3	55.6	37.4	61.2	43.6	71.8	4	4
35.3	38.4	17.3	56.1	38.9	60.7	46.7	65.8	49.5	75.4	5	5
38.4	31.8	3.5	40.1	27.4	51.8	36.6	62.6	46.5	73.8	5	5
10.6	2.6	0.8	24.4	4.4	20.0	6.8	29.0	16.7	40.7	2	2
23.4	11.0	20.8	19.7	1.6	37.7	18.4	56.0	37.6	69.9	4	4
11.3	9.2	20.8	2.8	19.7	2.7	0.9	46.3	27.1	67.3	4	4
23.4	25.4	45.6	38.9	22.5	45.6	33.1	56.7	39.3	67.7	4	4
48.7	49.0	45.6	62.9	49.6	62.9	50.4	64.4	51.1	67.5	5	5
41.0	27.5	12.9	41.7	29.0	41.6	28.7	52.1	39.3	68.8	5	5
73.6	29.4	46.4	55.9	57.0	79.0	60.0	80.9	60.7	88.3	6	6
55.5	46.2	54.7	46.6	57.4	59.2	49.8	61.2	50.7	65.3	5	5
35.2	49.2	30.1	38.3	50.4	54.3	37.3	73.2	57.3	84.1	6	6
33.8	19.3	48.5	11.5	19.0	39.8	18.5	53.4	30.4	67.9	3	3
60.6	43.6	48.3	30.8	37.8	26.8	33.3	51.7	37.7	51.9	4	4
41.6	39.6	51.3	34.2	34.5	42.5	49.9	66.6	51.5	77.7	6	6
59.4	43.8	32.6	17.5	30.2	12.7	46.4	62.2	39.0	74.5	4	4

Observations recommenced October 10, 1883

Observations recommenced.

Table showing the means of the daily maximum and minimum temperatures

Stations.	1883.									
	July.		August.		September.		October.		November.	
	Mean.		Mean.		Mean.		Mean.		Mean.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Springfield, Ill.	84.5	65.7	79.9	61.4	74.7	52.2	60.0	46.2	54.0	35.3
Stockton, Fort, Tex.	92.4	65.8	94.2	65.0	82.5	57.1	77.1	53.3	67.2	40.2
Tatoosh Island, Wash.						(1)	54.0	45.0	48.1	42.1
Thomas, Camp, Ariz.	96.9	69.7	96.3	69.3	91.5	59.7	77.2	42.3	66.2	31.8
Toledo, Ohio.	80.8	63.8	76.6	59.3	68.5	52.0	58.8	44.7	52.4	36.4
Unalaksha, Alaska.	56.8	43.7	57.0	44.5	50.6	41.1	49.3	38.0	41.2	30.5
Vicksburg, Miss.	92.9	73.9	92.5	71.0	86.8	64.6	80.6	63.0	67.8	48.8
Washington City.	87.7	67.2	82.4	62.7	74.8	56.2	65.5	49.3	56.2	39.4
West Las Animas, Colo.	93.3	61.7	89.7	60.5	81.1	49.1	65.5	36.0	61.2	21.7
Wilmington, N. C.	89.8	74.2	86.5	71.6	79.4	65.9	74.2	59.2	66.6	48.4
Yankton, Dak.	83.1	63.8	80.5	61.6	70.8	49.5	55.1	38.3	48.6	21.8
Yuma, Ariz.	106.8	80.3	105.6	79.1	101.9	71.6	80.8	55.0	74.9	48.1

<sup>1</sup> Observations began October 1, 1883.

(in degrees Fahrenheit) at stations of the Signal Service, &amp;c.—Continued.

1883.		1884.											
December.		January.		February.		March.		April.		May.		June.	
Mean.		Mean.		Mean.		Mean.		Mean.		Mean.		Mean.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
°	°	°	°	°	°	°	°	°	°	°	°	°	°
44.5	26.1	29.6	12.8	41.2	24.4	48.0	32.4	59.8	44.0	71.0	52.7	80.1	62.8
52.6	35.7	54.1	26.5	67.2	39.4	74.4	45.3	78.2	46.4	84.9	55.7	92.2	65.9
46.5	40.2	44.6	29.4	40.4	33.7	47.9	38.8	55.0	46.0	57.2	47.4	59.3	50.1
57.4	34.0	54.7	27.8	59.8	35.8	65.1	39.3	72.4	41.2	84.3	49.3	95.5	57.2
40.1	25.9	28.4	11.7	33.0	23.9	42.9	28.2	58.4	38.8	68.7	51.0	78.6	62.2
54.6	25.8	38.0	23.8	39.9	33.0	39.4	28.4	43.4	30.4	45.7	33.2	53.0	40.4
62.1	45.8	49.7	31.8	65.6	47.0	67.8	51.6	73.6	54.8	81.4	63.0	87.4	68.5
44.5	29.5	37.2	22.6	49.2	32.9	49.8	34.9	60.7	42.6	75.2	54.6	84.0	62.6
45.9	30.5	40.9	8.8	41.1	11.4	56.8	34.7	62.2	33.0	72.7	43.5	84.2	55.4
62.3	43.7	58.6	35.6	68.2	48.2	67.1	50.5	69.6	52.0	80.2	63.9	91.8	65.9
35.4	14.2	25.6	8.0	22.1	1.4	39.9	21.6	52.9	25.9	70.8	49.6	83.2	61.3
(7)	(7)	65.8	43.8	67.1	48.8	72.4	51.0	82.5	53.7	91.1	61.6	98.2	67.7

\* No record.

## APPENDIX 4i.

*Table of monthly and annual mean temperatures (in degrees Fahrenheit!) reported by voluntary observers of the Signal Service, United States Army, for the year ending June 30, 1894.*

[The daily means are generally obtained by dividing the sum of the 7 a. m. by 2, and twice the 9 p. m. observations by four; the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	1892.							1893.							Annual mean.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.			
Acotink, Va.	75.3	72.9	67.4	58.6	45.9	38.8	31.8	43.2	44.9	53.6	68.4	75.1	56.8		
Albany, S. C.	(1)	(1)	(1)	(1)	57.4	51.9	40.3	55.3	53.1	53.6	68.4	75.1	56.8		
Albany, Oreg.	66.6	63.8	60.4	46.8	46.4	38.0	38.9	37.0	45.0	52.7	73.7	67.5	51.6		
Alexandria, Ind.	70.0	68.3	55.9	45.8	31.3	17.0	7.5	4.9	(1)	(1)	59.7	(1)	(1)		
Allison, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	20.4	20.8	35.3	44.5	57.1	71.0	(1)		
Ames, Iowa	76.2	69.6	55.1	44.1	30.6	27.0	21.6	(1)	31.0	45.5	59.6	(1)	(1)		
Amherst, Mass.	63.7	63.7	58.7	44.0	(1)	(1)	41.7	(1)	60.0	64.0	74.4	(1)	(1)		
Anderson, Ga.	74.0	71.0	67.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Andersonville, Tenn.	76.2	73.1	68.6	61.3	49.3	39.7	35.6	33.7	45.7	54.7	65.5	73.7	59.3		
Ann Arbor, Mich.	(1)	(1)	(1)	(1)	(1)	27.5	52.0	65.6	63.2	66.0	80.3	72.1	(1)		
Archer, Fla.	63.3	61.4	58.7	47.8	39.7	27.5	52.0	(1)	(1)	(1)	(1)	(1)	(1)		
Ardenia (Phillipstown), N. Y.	72.0	69.0	62.0	51.0	44.0	29.0	36.0	44.4	50.5	58.0	70.0	73.0	59.7		
Ashwood, Tenn.	75.0	73.5	70.3	64.5	52.0	42.0	36.0	26.0	39.5	50.2	62.5	71.0	(1)		
Atchison, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Athens, Ga.	(1)	(1)	(1)	(1)	(1)	(1)	33.4	54.0	(1)	57.4	(1)	70.6	(1)		
Auburn, Ala.	(1)	(1)	(1)	67.9	54.8	50.2	33.4	(1)	(1)	(1)	(1)	(1)	(1)		
Auburn, N. Y.	(1)	(1)	(1)	(1)	(1)	27.5	17.5	23.0	30.0	43.3	53.5	66.0	(1)		
Austin, Tenn.	77.3	73.3	70.2	65.9	49.7	40.8	32.2	47.0	49.0	53.7	68.6	(1)	(1)		
Austin, Tex.	(1)	(1)	(1)	(1)	(1)	(1)	38.0	34.0	42.0	51.3	73.3	80.7	49.4		
Bainbridge Island, Wash.	62.5	62.5	58.0	46.3	44.3	41.3	38.0	(1)	(1)	(1)	(1)	(1)	(1)		
Beesh Grove, Tenn.	73.0	71.0	67.0	62.0	50.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Beaoli, Wis.	70.5	68.5	67.1	46.1	35.0	32.7	20.2	30.1	39.4	44.7	57.9	64.0	43.9		
Boston, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Boston, N. H.	(1)	(1)	(1)	(1)	(1)	(1)	30.9	(1)	(1)	(1)	(1)	(1)	(1)		
Bellevue, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Bellevue, Kans.	77.0	74.0	67.0	62.0	54.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Bordentown, N. J.	(1)	70.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Bordentown, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Brownsville, N. C.	77.1	(1)	(1)	(1)	(1)	2.2	34.3	(1)	(1)	(1)	(1)	(1)	(1)		

### REPORT OF THE CHIEF SIGNAL OFFICER.

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[illegible]





Guttenberg, Iowa.....	70.3	66.3	54.3	44.1	34.0	23.0	8.1	17.7	37.3	45.3	57.3	57.0	42.9
Hardin, Minn., Tenn.....	70.0	70.0	63.0	53.0	43.0	33.0	18.1	17.7	37.3	45.3	57.3	57.0	42.9
Hastings, Minn.....	70.0	68.5	61.8	54.6	45.0	35.4	26.1	9.5	34.2	44.6	57.5	56.8	43.2
Helvid, W. Va.....	67.6	63.0	59.7	54.3	41.8	35.2	26.8	39.0	41.0	46.4	57.8	57.5	49.7
Higlands, N. O.....	78.0	70.0	63.0	50.0	40.0	30.8	19.0	23.0	42.0	43.8	60.0	61.2	49.7
Hiram, Ohio.....	74.0	70.0	63.0	50.0	40.0	30.8	19.0	23.0	42.0	43.8	60.0	61.2	49.7
Holton, Kans.....	74.0	70.0	63.0	50.0	40.0	30.8	19.0	23.0	42.0	43.8	60.0	61.2	49.7
Howell, Tenn.....	70.5	63.5	54.5	45.5	35.5	27.0	15.1	27.2	36.7	46.7	62.7	60.9	43.6
Hudson, Mich.....	71.9	68.6	64.5	52.3	41.9	31.9	24.6	35.6	45.2	55.2	68.7	70.1	41.2
Humboldt, Iowa.....	68.3	63.1	52.2	45.1	37.1	27.1	18.0	25.2	34.2	44.6	57.8	57.5	43.4
Humphrey, N. Y.....	71.2	67.5	64.3	52.3	41.9	31.9	24.6	35.6	45.2	55.2	68.7	70.1	41.2
Hydesville, Cal.....	73.0	70.9	68.2	56.4	46.3	37.6	22.0	31.0	44.1	52.5	68.8	73.1	47.6
Independence, Kans.....	73.0	70.9	68.2	56.4	46.3	37.6	22.0	31.0	44.1	52.5	68.8	73.1	47.6
Independence, Mo.....	68.0	64.7	56.7	46.6	38.1	27.1	18.0	20.8	35.4	49.3	61.2	70.0	44.9
Indiana, Iowa.....	68.6	65.1	56.4	47.6	40.4	28.2	19.5	23.6	30.4	41.5	54.0	68.9	45.9
Ionia, Mich.....	75.0	71.3	64.4	56.0	42.6	30.9	19.1	23.6	30.4	41.5	54.0	68.9	45.9
Ithaca, N. Y.....	77.3	72.9	64.1	48.0	38.3	28.0	15.8	19.7	35.4	53.2	64.3	75.1	47.6
Jacksonburg, Ohio.....	80.2	76.8	71.8	62.9	53.4	44.8	36.1	47.4	49.3	52.6	64.3	75.1	47.6
Jeffersonville, Ind.....	64.4	63.9	55.6	45.3	36.9	28.7	19.1	47.4	49.3	52.6	64.3	75.1	47.6
Johnson, Neb.....	63.2	63.2	53.7	43.7	34.2	25.7	19.1	47.4	49.3	52.6	64.3	75.1	47.6
Johnstown, N. Y.....	78.0	76.0	67.0	53.0	41.2	31.0	23.0	33.7	44.0	52.8	64.3	70.8	46.8
Kanawha, Miss.....	72.7	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Kantone, N. Y.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Kingston Springs, Tenn.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Lacoma, Ind.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
La Fayette, Ind.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Lansing, Mich.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Larchland, Ill.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Lawrence, Kans.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Lead Hill, Ark.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Lebanon, Mo.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Leedsdale, Pa.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Limona, Pa.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Lincoln, Neb.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Litchfield, Mich.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Livington, Tenn.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Logan, Iowa.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Logan, Utah.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Logansport, Ind.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Luling, La.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Madison, Wis.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Manchester, Iowa.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Manchester, Tenn.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Manhattan, Kans.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Manhattan (B), Kans.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Manistique, Mich.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Manitowoc, Wis.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8
Margaretta Township, Ohio.....	72.0	67.8	59.4	48.3	40.1	31.7	13.6	23.9	32.3	45.3	58.2	70.7	46.8



New Ulm, Tex.	52.0	72.9	62.4	52.3	44.0	55.1	72.2	62.5	72.0
Nora Springs, Iowa	57.0	72.9	54.7	52.0	4.0	50.0	72.2	52.4	72.0
Norfolk, Mass.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Norfolk, Va.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
North Lewis, Ohio	72.9	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
North Platte, Neb.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
North Platte, N. Y.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Oakland, Cal.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Oakwood, Cal.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Orem, N. U.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Ottawa, Iowa	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Palermo, N. Y.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Palmarillo, Dutch Guiana, S. America	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Paris, Tenn.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Paterson, N. J.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Peoria, Ill.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Peru, Neb.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Phillipsburg, N. J.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Pierce City, Mo.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Pleasant Grove, Wash. T.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Point Lobos, Cal.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Point Pleasant, La.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Polo, Ill.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Port Jervis, N. Y.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Portsmouth, Ohio	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Poway, Cal.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Prarie du Chien, Wis.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Princeton, Cal.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Princeton, Mass.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Pueblo, Colo.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Puerto de Luna, N. Mex.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Pulaski, Tenn.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Quakertown, Pa.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Raleigh, N. C.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Rapid City, Dak.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Readington, N. J.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Receiving Reservoir, D. C.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Red Willow, Neb.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Richardson, Ark.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Richmond, Ky.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Ridgely, Tenn.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Riley, Ill.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Ripon, Wis.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Rising Sun, Ind.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Rock Creek Bridge, D. C.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Rockford, Ill.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Rockville, Tenn.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Rose, Mass.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Ruggles, Ohio	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Saint Louis, Mo.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Salina, Kans.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0
Salina City, Cal.	62.0	62.0	54.7	52.0	1.0	50.0	72.2	52.4	72.0



Warrenton, Mo.....	(1)	40.3	(1)	28.4	(1)	10.7	(1)	34.2	54.0	65.5	(1)	46.4
Warren, Wis.....	(1)	48.7	(1)	28.4	(1)	10.7	(1)	34.2	40.5	55.1	(1)	46.4
Wausau, Ohio.....	(1)	57.2	(1)	37.2	(1)	37.2	(1)	37.2	44.9	58.3	(1)	46.4
Waverly, Tenn.....	(1)	63.0	(1)	63.0	(1)	63.0	(1)	63.0	(1)	(1)	(1)	40.8
Waverly, Ark.....	(1)	73.4	(1)	73.4	(1)	73.4	(1)	73.4	55.2	68.7	(1)	40.8
Weldon, N. C.....	(1)	75.5	(1)	75.5	(1)	75.5	(1)	75.5	50.7	60.8	(1)	51.9
Wellington, Kans.....	(1)	73.4	(1)	73.4	(1)	73.4	(1)	73.4	48.6	58.0	(1)	51.9
Wellington, Pa.....	(1)	63.0	(1)	63.0	(1)	63.0	(1)	63.0	45.7	58.7	(1)	50.8
Wellington, Mass.....	(1)	67.9	(1)	67.9	(1)	67.9	(1)	67.9	48.7	60.4	(1)	48.9
West Chester, Pa.....	(1)	72.5	(1)	72.5	(1)	72.5	(1)	72.5	47.4	62.0	(1)	48.9
West Chester, Ohio.....	(1)	70.7	(1)	70.7	(1)	70.7	(1)	70.7	47.0	62.0	(1)	48.9
Westmoreland, Kans.....	(1)	66.2	(1)	66.2	(1)	66.2	(1)	66.2	(1)	(1)	(1)	48.9
White Bluffs, Tenn.....	(1)	73.0	(1)	73.0	(1)	73.0	(1)	73.0	47.7	58.6	(1)	48.9
White Plains, N. Y.....	(1)	68.7	(1)	68.7	(1)	68.7	(1)	68.7	45.9	58.3	(1)	48.9
Wilkes Barre, Pa.....	(1)	65.4	(1)	65.4	(1)	65.4	(1)	65.4	42.1	54.5	(1)	48.9
Williamstown, Mass.....	(1)	63.1	(1)	63.1	(1)	63.1	(1)	63.1	52.9	65.0	(1)	48.9
Woodstock, Md.....	(1)	63.4	(1)	63.4	(1)	63.4	(1)	63.4	43.0	54.2	(1)	48.9
Woodstock, Va.....	(1)	67.8	(1)	67.8	(1)	67.8	(1)	67.8	(1)	(1)	(1)	48.9
Worcester, Mass.....	(1)	63.4	(1)	63.4	(1)	63.4	(1)	63.4	50.8	60.5	(1)	48.9
Wyandotte, Kans.....	(1)	64.0	(1)	64.0	(1)	64.0	(1)	64.0	40.6	63.7	(1)	48.9
Wytheville, Va.....	(1)	71.4	(1)	71.4	(1)	71.4	(1)	71.4	45.3	65.9	(1)	48.9
Yates Centre, Kans.....	(1)	73.8	(1)	73.8	(1)	73.8	(1)	73.8	45.6	61.8	(1)	48.9

1 No record.

## APPENDIX 42.

Maximum and minimum temperatures and annual range of temperature (in degrees Fahrenheit, 1863, to Jan.,

[From self-register

Station.	1863.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Accotink, Va.....	88	80	88	87	87	45	84	37	78	18	88	38
Aiken, S. C.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	24	78	28
Albany, Oreg.....	89	84	82	48	90	46	86	29	61	28	82	28
Alexandria, Dak.....	88	55	91	51	87	28	73	17	62	5	58	18
Allison, Kans.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	70	14	61	28
Ames, Iowa.....	92	56	86	55	85	36	80	28	(1)	(1)	(1)	18
Amherst, Mass.....	93	55	86	43	80	36	77	27	67	18	88	18
Andersonville, Ga.....	(1)	(1)	(1)	(1)	(1)	(1)	98	54	79	29	77	21
Andersonville, Tenn.....	96	86	94	50	91	46	(1)	(1)	(1)	(1)	77	21
Anna, Ill.....	88	57	33	57	93	44	88	37	78	18	78	11
Ann Arbor, Mich.....	88	46	86	46	83	31	80	29	64	8	88	11
Archer, Fla.....	94	71	92	72	90	62	94	58	86	33	88	21
Ardania (Phillipstown), N. Y.....	92	50	86	53	89	45	80	31	62	20	88	21
Ashton Plantation, Pa.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	18
Ashwood, Tenn.....	94	64	92	86	91	50	84	56	76	20	88	18
Atchison, Kans.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	18
Athens, Ga.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	18
Auburn, Ala.....	(1)	(1)	(1)	(1)	(1)	(1)	90	43	78	24	78	20
Auburn, N. Y.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	18
Austlin, Tenn.....	98	56	92	56	91	50	86	44	74	16	88	18
Austin, Tex.....	98	56	92	56	91	50	92	49	88	29	79	27
Bainbridge Island, Wash.....	84	46	78	48	78	38	68	33	60	26	84	27
Barnesville, Tex.....	(1)	(1)	(1)	(1)	110	66	(1)	(1)	(1)	(1)	88	18
Battle Creek, Mich.....	(1)	(1)	90	48	86	29	76	32	62	20	88	11
Beech Grove, Tenn.....	90	56	89	49	91	45	86	40	78	16	88	11
Beloit, Wis.....	94	46	91	47	85	34	80	28	61	4	84	21
Belvidere, N. J.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Benton, Tenn.....	97	64	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Bethel, Conn.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Blooming Grove, Pa.....	92	52	90	46	81	38	75	30	64	14	88	21
Bolivar, Tenn.....	91	66	91	60	90	50	84	44	74	18	88	21
Bowling Green, Ky.....	94	62	92	55	93	50	(1)	(1)	79	9	88	21
Brevard, N. C.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Bristol, N. H.....	92	52	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Brownsville, Tenn.....	90	61	98	54	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Brunswick, Ga.....	98	85	95	78	90	79	90	60	(1)	(1)	(1)	21
Bunker Hill Ill.....	(1)	(1)	(1)	(1)	98	39	79	28	75	6	88	21
Burlington, Vt.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	60	12	84	18
Canal Dover, Ohio.....	100	50	(1)	(1)	(1)	(1)	94	33	74	26	79	8
Carson City, Nev.....	100	43	96	38	91	34	72	21	67	10	87	7
Careyville, Tenn.....	90	60	88	52	(1)	(1)	(1)	(1)	65	14	(1)	21
Catawissa, Pa.....	91	48	90	46	81	35	78	28	70	18	86	21
Cedar Rapids, Iowa.....	98	46	91	43	(1)	(1)	87	24	64	Zero.	87	21
Chambersburg, Pa.....	92	56	91	55	85	29	75	32	69	15	83	8
Chapel Hill, N. C.....	102	60	101	53	94	49	92	42	83	17	71	20
Charlestown, Mass.....	96	50	91	49	81	40	79	28	67	16	86	12
Charlotte, Vt.....	87	52	90	50	82	33	78	18	72	10	86	17
Chester, Minn.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Chickasaw, Tenn.....	(1)	(1)	(1)	(1)	88	42	(1)	(1)	(1)	(1)	(1)	21
Cincinnati (G. W. H.), O.....	96	61	94	56	93	44	87	37	78	13	82	16
Clarksville, Tex.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	71	28
Clay Center, Kans.....	103	62	(1)	(1)	90	52	86	30	72	11	74	3
Clear Creek, Nebr.....	(1)	(1)	98	57	(1)	(1)	82	24	68	5	88	9
Cleburne, Tex.....	102	70	102	58	100	42	96	38	84	28	78	14
Cleveland, Ohio.....	98	56	92	51	87	36	81	36	67	17	88	14
Clinton, Ind.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21
Coal Harbor, British Columbia.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21

## APPENDIX 42.

renheit) reported by voluntary observers of the Signal Service, United States Army, July 1884, inclusive.

ing thermometers.]

1884.												Annual range.
January.		February.		March.		April.		May.		June.		
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
52	0	73	12	80	10	80	33	92	50	96	54	97.6
50	0.4	76	18	80	23	89	38	90	54	(1)	(1)	83
50	24	66	8	66	31	90	40	88	46	88	52	83
45	-33	47	-34	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	83
42	-17	30	-20	77	Zero.	84	27	92	82	96.5	54	83
(1)	(1)	(1)	(1)	(1)	Zero.	(1)	(1)	(1)	(1)	(1)	(1)	83
40	-8	46	5	84	26	70.3	31.2	85.2	37.6	(1)	(1)	83
70	12	81	26	81	26	91.8	44.4	98	45	(1)	(1)	83
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	83
65	-21	68	6	72	15	88	11	98	47	92	55	114
51	-16.6	(1)	(1)	(1)	(1)	68.5	30	(1)	(1)	(1)	(1)	114
79	21	98	36	93	36	90	44	96	61	90	63	74
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	30	93.5	47	74
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	50	90	52	74
68	1	70	1	76	25	82	34	88	52	94	58	98
(1)	(1)	(1)	(1)	(1)	(1)	77	30	88	41	90	55	98
47	3	74	16	(1)	(1)	87	33	90.5	50	(1)	(1)	98
47	-14	50	4	56	2	72	30.5	96	37	87	54	98
64	12	68	4	73	22	82	36	96	42	(1)	(1)	98
76	30	(1)	(1)	84	32	87	41.5	92	49	96	64	98
54	25	56	7	86	22	78	38	84	38	90	43	77
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	77
47	4	55	6	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	77
39	27	88	10	(1)	(1)	79	23	79	32.5	96	43.5	121
(1)	(1)	(1)	(1)	(1)	(1)	68	35	(1)	(1)	(1)	(1)	121
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	121
46	6	55	4	(1)	(1)	76	28	88	42	88	50	98
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	98
62	3	69	3	74	6	(1)	(1)	(1)	(1)	(1)	(1)	98
60	3	71	11	74	11	84	28	88	40	94	44	98
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	98
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	98
68	27	82	1	73	5	84	31	96	38	95.1	50.3	98
46	-14	49	-19	56	8	72.3	24.5	81.8	36.5	88.5	42.4	98
50	-16	63	Zero.	73	8	76	32	84	32	(1)	(1)	98
56	5.5	53	-18	66	21	71	27	82	32	89.5	36.5	118
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	118
46	5	62	Zero.	65	Zero.	76.5	31.5	89.5	35.5	89.5	43.5	96
39	-34	44	-14	67	-10	80	23	89	33	88	48	96
45	4	52	4	65	8	76	32	91	38	90	56	96
61	Zero.	76	16	80	16	88	35	94	43	96.5	41	102
50	2	59	3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	102
39	-16	48	3	62	-12	73	26	82	38	91	48	108
29	-38	40	-24	63	-18	70	21	81	35	89	51	108
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	108
57	20	70	2	76	9	83	33	93	46	98	60	118
71	8	75	10	79	30	84	34	83	50	92	56	118
60	-17	68	9	(1)	(1)	(1)	(1)	(1)	(1)	95	55	118
46	-24	51	-15	70	-5	(1)	(1)	88	39	93	53	118
73	1	78	16	84	28	90	32	92	46	96	58	101
50	5.5	63	1	68	3	74	26.5	90	36	98	51	100.5
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	38	94	50	100.5
(1)	(1)	(1)	(1)	(1)	(1)	72	36	80	40	(1)	(1)	100.5



*Maximum and minimum temperatures and annual range of temperature (in degrees*

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
College City, Cal.	90	62	90	62	90	62	90	62	90	62	90	62
College Hill, Ohio	90	62	90	62	90	62	90	62	90	62	90	62
Collinsville, Ill.	94.5	56	94	53	89	38	84	31	70	10.5	60	12
Conception, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Contoocook, N. H.	(1)	(1)	87	40	(1)	(1)	(1)	(1)	72	15	56	17
Conway, Kans.	(1)	(1)	94	62	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Cooperstown, N. Y.	84	55	82	47	75	38	74	27	66	14	54	15
Cornish, Me.	85	62	84	45	81	38	74	22	(1)	(1)	49	19
Covington, Tenn.	83	61	(1)	(1)	94	50	89	42	75	20	(1)	(1)
Cresco, Iowa	98	52	86	50	82	33	80	23	60	3	50	24
Crete, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Cumberland, Md.	90	56	86	56	78	42	76	40	68	18	56	18
Curryville, Mo.	86	(1)	(1)	(1)	(1)	(1)	(1)	(1)	64	10	(1)	(1)
Danemora, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Des Moines, Iowa	95	51	91	44	91	35	86	31	69	4	58	14
De Soto, Nebr.	97	53	83	48	91	39	83	24	64	6	54	11
Devil's Lake, Dak.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Dillingersville, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Distributing reservoir, D. C.	95	68	92	61	85	48	83	37	70	22	58	22
Dorset, Vt.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	71	6	57	21
Drifton, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Dudley, Mass.	90	47	87	46	85	34	86	26	64	11	(1)	(1)
Dyersburg, Pa.	87	44	87	37	78	28	72	18	65	9	58	10
Dyersburg, Tenn.	81	64	98	58	87	40	86	38	78	17	(1)	(1)
Easton, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
East Portland, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
East Tawas, Mich.	85	51	85	50	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Elk Falls, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	46	10
Elmhurst, Ill.	96	55	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Embarras, Wis.	94	52	85	50	82	32	77	25	(1)	(1)	52	20
Emmitsburg, Md.	(1)	(1)	(1)	(1)	83	40	80	28	70	12	60	5
Emporia, Kans.	100	56	92	56	92	32	87	29	72	10	66	23
Eola, Oreg.	91	52	47	55	88	48	61	38	58	32	53	24
Evansville, Wis.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Factoryville, N. Y.	90	52	89	40	80	33	77	22	70	8	58	4
Fall Brook, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Fall River, Mass.	88	49	83	47	80	39	77	28	65	17	55	10
Fallington, Pa.	93	57	91	52	84	42	81	35	74	18	56	3
Fallston, Md.	98	55	80	40	80	40	81	34	70	19	58	9
Fayetteville, Ark.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	71	12
Flat Creek, Tenn.	90	62	89	48	91	47	84	42	72	16	(1)	(1)
Florence Station, Tenn.	95	63	94	63	92	54	87	47	75	19	(1)	(1)
Flushing, N. Y.	93	61	84	60	78	48	78	46	66	21	59	1
Forsyth, Ga.	96	74	95	65	96	60	96	51	84	28	76	24
Fort Collins, Colo.	(1)	(1)	91	47	95	32	74	18	66	17	57	4
Fort Madison, Iowa	96	80	98	52	89	48	88	80	81	66	9	59
Fort Scott, Kans.	97	64	97	61	95	46	90	86	76	15	72	8
Fort Wayne, Ind.	95	58	95	48	90	37	83	36	68	11	58	10
Fostoria, Tenn.	(1)	(1)	90	45	90	42	87	25	69	14	(1)	(1)
Frankfort, Ky.	91	56	93	47	89	39	84	40	73	13	65	10
Franklin, Pa.	88	46	86	42	80	32	76	20	62	12	48	4
Franklin, Tenn.	89	68	87	54	87	48	82	44	74	16	(1)	(1)
Franklin, Wis.	(1)	(1)	(1)	(1)	(1)	(1)	77	28	63	5	(1)	(1)
Freehold, N. J.	96	51	91	47	88	37	80	29	(1)	(1)	(1)	(1)
Fremont, Nebr.	102	52	93	46	98	40	88	24	66	3	57	12
Friendship, N. Y.	88	50	82	38	78	27	82	17	68	10	52	2
Gadsden, Tenn.	91	62	91	61	89	54	84	45	73	20	(1)	(1)
Gardiner, Me.	85	44	88	41	74	35	71	18	58	12	47	(1)
Garrettsville, Ohio	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Genoa, Nebr.	94	54	92	53	90	40	78	20	64	4	58	9
Germantown, Pa.	92	59	89	58	81	41	82	33	70	20	54	6
Golden, Colo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	62	15
Grafton, N. H.	90	43	88	35	80	30	72	17	60	12	46	4
Grampian Hills, Pa.	92	44	94	44	83	29	80	24	60	4	52	7
Grand Coteau, La.	92	78	92	72	90	58	90	48	88	32	77	30
Grand Junction, Colo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Grand Rapids, Mich.	(1)	(1)	(1)	(1)	90	81	(1)	(1)	60	11	57	11
Grand Turk Island, W. I.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Grand View, Tenn.	94	49	85	44	90	32	81	39	69	10	(1)	(1)
Grassy Cove, Tenn.	88	57	89	43	87	41	(1)	(1)	68	12	(1)	(1)
Great Falls Reservoir, Md.	89	62	90	56	84	43	80	34	72	13	60	12
Greenville, Tenn.	90	57	(1)	(1)	90	53	80	43	73	19	(1)	(1)
Greenfield, Ind.	89	58	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Green Springs, Ala.	89	76	100	65	95	64	94	44	80	24	70	22
Grief, Tenn.	98	63	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

*Fahrenheit) reported by voluntary observers of the Signal Service, &c.—Continued.*

1884.

January.		February.		March.		April.		May.		June.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
67	28	76	26	78	36	82	47	94	58	96	55	117.5
54	19	60	2	70	4	(1)	32	90	40	96	61	
64	23	61	3	70	8	81.5	32	85	43	93	52	100
47	31.5	53	9.7	68	0.5	73	25	80	85	85.1	57	
(1)	(1)	(1)	(1)	56	-11	(1)	(1)	85	32	(1)	(1)	126
45	10	46	1	49	Zero.	68	27	84	34	85	54	
38	11	47	3	56	-4	(1)	(1)	83	38	92	46	92
(1)	(1)	47	(1)	(1)	(1)	(1)	78	(1)	(1)	(1)	(1)	
38	53	36	-18	66	-16	(1)	20	87	85	87	63	126.3
45	25.3	57	-16	73	-4.6	80.6	24.5	85	32.2	91	44.8	
54	2	62	3	65	9	76	30	85	40	85	50	121
(1)	(1)	52	Zero.	70	Zero.	(1)	(1)	79	26	87	45	
(1)	(1)	(1)	(1)	47	-5	64	26	(1)	(1)	(1)	(1)	90
50	31.3	51	-8	72	-8	(1)	(1)	87	40	(1)	(1)	
46	24	53	-14	69	-4	75	25	80	41	86	54	107
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	32	94	45	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	64	15	(1)	(1)	111
48	5	71	13	65	-14	78	34	90	45	93	55	
47	19.5	57	1	53	-9	70.8	12	82.5	29.8	87	38.5	106
(1)	(1)	56	8	65	-1	73	24	88	32	92	41	
47	3	(1)	(1)	(1)	(1)	(1)	(1)	86	27	(1)	(1)	88
45	16.3	45	4	58	-6	71	31	90	43	91	52	
43	1	(1)	6	64	5	(1)	(1)	92	47	96	54	106
(1)	(1)	56	(1)	(1)	(1)	(1)	(1)	86	42	88	50	
38	2	58	4	50	26	66	32	(1)	(1)	86	51	89
46	55	40	-20	62	-15	76	26	84	42	90	49	
57	13	60	3	69	9	79	31	86	46	89	54	111
44	21	47	-10	62	-25	80	28	84.5	38	83	50	
76	23	50	1	68	-15	75	41	86	43	84	52	106
48	1	55	39	57	Zero.	73	25	87	30	88	40	
47	4	52	4	75	28	(1)	26	(1)	33	90	40	128
47	3	64	8	63	8	73	33	87	46	93	53	
57	19	67	9	69	8	71	30	85	40	92	49	121
73	33	77	5	73	14	78	32	85	40	90	46	
32	11	48	6	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	113
40	24	78	20	80	26	71	13	92	50	93	68	
32	11	64	1	58	-12	88	28	78	31	91	56	128
52	18	57	7	77	1	81	31	82	42	95	58	
58	19.8	69	13.4	70	3	80	30	83	40	95	55	128
44	23.8	59	4	60	-10	88	25	88.2	43.6	92.2	52.3	
47	28	67	11.2	52	-4	79	30.2	80	34	88	52	104
44	19	58	23	70	9	78	24	87	29	96	47	
42	13	44	Zero.	48	-19	63	24	75	32	84	37	123
40	28	56	23.6	62	-10	76	27	82	30	92	40	
61	36	67	17.5	58	5	77	22	86	39	95	45	110
76	16	78	8	56	-11	72	23	84	41	92	50	
36	18	55	11	63	-38	81.9	33.8	88	29	86	46	77.2
(1)	(1)	(1)	(1)	61	-6	76	27	83	36	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	36	94	48	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	30	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	43	30	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	32	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	29	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	28	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	27	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	26	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	25	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	24	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	23	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	22	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	20	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	19	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	18	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	17	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	16	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	15	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	14	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	13	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	12	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	11	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	10	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	9	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	8	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	7	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	6	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	5	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	4	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2	(1)	(1)	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	(1)	(1)	96
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0	(1)	(1)	

*Maximum and minimum temperatures and annual range of temperature in degrees*

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Griffin, Ind.	80	46	( )	( )	85	29	81	30	85	4	80	1
Gunnison, Colo.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Guttenberg, Iowa	100	54	94	50	94	32	( )	88	( )	24	( )	( )
Hampton, Va.	85	68	84	68	81	63	( )	86	( )	42	( )	( )
Harrison's Mills, Tenn.	( )	( )	90	55	( )	( )	( )	86	( )	( )	( )	( )
Harrisville, Mich.	( )	( )	93	33	( )	( )	( )	( )	( )	( )	( )	( )
Hartford, Conn.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Hastings, Minn.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Haverford College, Pa.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Heath, Mass.	83	46	92	40	80	28	76	37	85	21	8	24
Helvetia, W. Va.	82	48	88	43	83	34	78	29	82	10	8	5
Highlands, N. C.	85	54	83	45	83	37	82	40	85	65	70	5
Hilledale, Mich.	80	48	90	43	85	29	78	36	83	68	63	1
Hiram, Ohio	( )	( )	( )	( )	( )	( )	80	26	80	7	7	1
Holton, Kans.	86	58	94	46	86	37	( )	( )	88	75	( )	( )
Howell, Tenn.	80	63	92	56	85	50	88	31	81	75	4	( )
Hudson, Mich.	( )	( )	( )	( )	( )	( )	88	43	88	74	18	7
Hulmeville, Pa.	( )	( )	90	56	84	34	( )	88	31	61	( )	( )
Humboldt, Iowa	84	51	90	51	92	30	77	30	82	63	Zero.	Zero
Humphrey, N. Y.	87	50	87	46	73	33	77	30	83	64	64	10
Hydeville, Cal.	( )	( )	( )	( )	( )	( )	86	32	82	15	12	10
Independence, Iowa	88	52	86	49	81	34	( )	( )	80	58	79	10
Independence, Kans.	90	55	( )	( )	92	40	80	31	81	58	13	6
Indianola, Iowa	86	60	91	54	92	46	88	30	80	77	16	1
Ionia, Mich.	86	50	94	37	88	29	79	30	87	62	8	1
Ithaca, N. Y.	( )	( )	90	42	79	34	78	26	82	65	58	1
Jacksonburg, Ohio	( )	( )	94	48	( )	( )	77	34	86	68	13	8
Jeffersonville, Ind.	94	57	( )	( )	( )	( )	80	28	88	68	64	14
Johnson, Nebr.	100	60	98	56	93	42	( )	( )	75	75	57	1
Johnsontown, Va.	95	69	95	64	87	53	84	24	84	64	57	2
Johnstown, N. Y.	88	39	88	34	79	20	90	44	79	79	25	2
Kalamazoo, Mich.	90	50	93	46	90	36	75	17	70	70	58	2
Kiantone, N. Y.	86	45	85	40	( )	( )	76	31	61	62	14	9
Kington Springs, Tenn.	90	60	91	52	89	51	74	29	81	62	( )	( )
Klamath, Oreg.	( )	( )	( )	( )	( )	( )	80	38	88	73	( )	( )
Laconia, Ind.	97	56	94	53	92	43	( )	( )	( )	( )	11	14
Lafayette, Ind.	92	50	89	55	87	32	82	32	84	64	4	1
Lancaster, Wis.	( )	( )	91	44	( )	( )	82	32	82	64	33	15
Lansing, Mich.	90	50	92	43	89	32	84	22	84	64	9	9
Larchland, Ill.	( )	( )	( )	( )	( )	( )	78	30	80	64	15	1
Lawrence, Kans.	( )	( )	92	52	91	46	( )	( )	82	58	12	15
Lead Hill, Ark.	100	61	102	56	95	38	87	32	82	74	15	10
Lebanon, Mo.	( )	( )	( )	( )	( )	( )	92	35	85	88	15	15
Leetsdale, Pa.	86	52	82	50	74	30	( )	( )	( )	( )	54	15
Lenoir, N. C.	92	60	87	55	84	47	72	31	82	62	15	17
Liberty Hill, La.	( )	( )	( )	( )	( )	( )	78	42	75	18	15	16
Limona, Fla.	100	70	99	70	96	68	( )	( )	( )	( )	84	21
Lincoln, Nebr.	106	61	102	64	96	44	94	63	83	96	48	3
Litchfield, Mich.	( )	( )	77	60	73	38	88	30	80	( )	( )	( )
Livingston, Tenn.	88	61	90	54	89	41	71	35	85	( )	( )	( )
Logan, Iowa	97	56	97	47	93	42	83	41	83	45	6	9
Logan, Utah	( )	( )	( )	( )	( )	( )	86	24	83	45	8	9
Logansport, Ind.	96	52	92	48	96	52	88	30	80	89	34	24
Lulling, La.	( )	( )	( )	( )	( )	( )	92	48	80	89	69	28
Lunenburg, Vt.	90	50	82	42	78	40	70	30	84	64	51	11
Madison, Wis.	88	55	86	51	79	38	70	20	80	64	2	10
Manchester, Iowa.	( )	( )	87	51	80	37	79	28	83	63	4	6
Manchester, Tenn.	91	68	90	55	90	41	87	31	81	74	14	5
Manhattan, Kans.	98	57	96	58	100	42	84	28	84	74	18	1
Manhattan (B), Kans.	( )	( )	( )	( )	( )	( )	90	38	73	73	68	10
Manistique, Mich.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Manitowoc, Wis.	87	55	85	50	76	33	( )	( )	( )	( )	51	10
Margaretta Township, Ohio.	84	66	86	64	79	50	73	28	85	55	22	13
Marion, Ohio	( )	( )	( )	( )	( )	( )	84	33	83	75	10	14
Marion, Va.	88	55	90	48	84	42	( )	84	73	73	55	10
Marquette, Nebr.	( )	( )	86	63	84	40	80	35	82	65	14	14
Marshall, Mich.	( )	( )	( )	( )	( )	( )	76	32	75	56	56	10
Maryville, Tenn.	96	66	92	58	93	43	( )	84	76	76	70	7
Mattson, Ill.	96	55	96	52	94	37	84	45	86	60	19	6
Maud, Kans.	( )	( )	( )	( )	( )	( )	86	32	80	60	( )	( )
Maynard, Iowa	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Mayport, Fla.	97	71	97	76	91	66	86	45	86	65	22	10
Mazatlan, Mexico	91	77	92	69	92	68	92	65	81	81	73	7
McDonogh, Md.	89	58	94	45	79	46	90	68	89	68	68	10
McKenzie, Tenn.	96	68	96	64	89	46	77	34	86	73	16	16

*Fahrenheit) reported by voluntary observers of the Signal Service, &c.—Continued.*

1884.													Annual range.
January.		February.		March.		April.		May.		June.			
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
32	—	63	—4	68	—5	70	25	(1)	(1)	(1)	(1)	.....	
31	—30	36	—27	43	—18	58	12	(1)	(1)	(1)	(1)	.....	
42	—38	38	—18	68	—12	86	26	84	34	90	50	138	
51	7	60	23	52	26	(1)	(1)	78	57	85	60	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
39	—33	37	—26	62	—22	74.5	19	83.7	32.5	97	49.3	.....	
40	7	60	6	59	6	68	32	85	30.5	99	45	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	32	88	41	.....	
58	—7	68	—2	68	8	78	25	88	36	96	40	103	
31	—8	64	—4	69	10	76	22	80	44	80	52	94	
49	—20	54	—7	60	—9	76	22	80	30	95	47	115	
(1)	(1)	60	—12	61	Zero.	67	29	(1)	(1)	89	56	.....	
54	—24	59	—8	75	7	(1)	(1)	(1)	(1)	(1)	(1)	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
47	—30	55	—8	(1)	(1)	(1)	(1)	83	28	91	47	.....	
45	—8	62	8	(1)	(1)	(1)	(1)	85	38	96	50	.....	
41	—33	44	—23	66	—10	70	27	80	36	86	36	127	
37	—9	54	—15	49	—4	70	34	84	33	88	50	103	
65	30	78	24	68	34	78	40	80	46	76	50	.....	
39	—29	40	—10	63	—10	74	27	76	40	82	56	117	
62	—20	64	—1	75	16	78	28	91	35	99	49	.....	
47	—28	51	—6	69	—4	70.4	30	77	40	88	60	124	
45	—24	50	—18	60	—8	78	26	78.5	31.5	89	44	118	
46	—15	55	—4	56	—3.5	78	24	90	32	91.5	44	.....	
40	—28	64	4	68	Zero.	89	20	89	38	101	54	.....	
(1)	(1)	70	11	74	10	82	32	88	43	(1)	(1)	.....	
53	—28	56	—14	68	2	78	31	(1)	(1)	(1)	(1)	.....	
61	4	76	19	72	19	79	37	(1)	(1)	91	58	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
42	—10	49	—1	62	6	(1)	(1)	81	39	90	51	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
69	—23	70	3	73	6	83	31	87	44	95	37	.....	
55	—28	60	—4	70	—5	79	28	80	36	(1)	(1)	.....	
47	—13	56	—13	64	—9	76	25	82	34	89	47	105	
46	—28	45	—3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
57	—21.5	57	—1	73	12	76.5	28.5	85	30	92	48	.....	
63	—15	73	Zero.	79	17	87	28	93	46	100	51	117	
76	—32	68	—1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
52	—12	65	Zero.	66	1	77.2	22	86.5	31.8	96	47.9	102	
54	3	66	11	70	12	(1)	(1)	74	(1)	86	45	.....	
71	13	71	22	77	48	70	53	83	68	94	72	.....	
82	28	86	40	91	38	95	47	98	62	100	62	72	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
48	—28	56	—10	70	—4	(1)	(1)	84	41	94	44	.....	
44	—13	43	—34	42	—17	(1)	(1)	(1)	(1)	(1)	(1)	.....	
60	—24	80	—5	72	—4	88	26	84	40	92	58	120	
78	18	(1)	(1)	(1)	(1)	75	41	(1)	(1)	99	64	.....	
46	—23	45	—4	50	—12	68	20	78	35	86	40	113	
42	—27.2	37	—13	61	—9.3	76	25	78	30	85	47	115.2	
(1)	(1)	48	—14	68	—9	80	31	83	38	90	47	.....	
69	—23	83	—6	(1)	(1)	(1)	(1)	(1)	(1)	101	54	.....	
58	—9	(1)	(1)	80	10	88	27	88	37	(1)	(1)	.....	
43	—21	37	—26	62	—26	65	17	79	20.5	83	29	.....	
42	—22	43	—14	58	—10	64	26	80	30	86	40	109	
50	—16	46	6	57	5	72	31	69	48	80.2	56.2	102	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
60	—8	68	Zero.	72	8	79	27	82	41	90	52	98	
47	—22	50	—8	66	10	78	32	81	41	89	67	.....	
(1)	(1)	43	—12	43	8	80	30	81	42	92	53	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	
62	—28	62	2	70	—3	83	30	85	42	94	52	124	
(1)	(1)	(1)	(1)	(1)	(1)	79	22	(1)	(1)	(1)	(1)	.....	
73	27	82	41	(1)	43	86	55	80	69	90	70	70	
79	53	80.8	55.5	(1)	(1)	81.3	54	86	61.3	(1)	(1)	.....	
(1)	(1)	63	7	62	3	72	33	84	41	87	49	.....	
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....	

<sup>1</sup> No record.

Maximum and minimum temperatures and annual range of temperature (in degs)

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
McMinnville, Tenn.	93	66	90	60	86	49	85	48	76	17	( )	( )
McNary Station, Tenn.	93	65	92	60	( )	( )	( )	( )	( )	( )	( )	( )
Menand Station, near Albany, N. Y.	91	59	87	44	80	35	73	26	66	18	53	-11
Mendon, Mass.	89	56	88	56	72	43	76	27	67	16	75	13
Mendon, Mich.	89	56	88	56	72	43	( )	( )	( )	( )	60	3
Milan, Tenn.	95	59	98	52	93	39	89	40	76	16	75	3
Milledgeville, Ga.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Milton, Mass.	94	58	98	47	81	38	78	23	67	18	58	-11
Millville, Pa.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Minneapolis, Minn.	94	57	94	50	84	29	74	19	59	2	46	-11
Monticello, Iowa	96	49	92	49	84	31	87	27	63	18	54	-11
Moorestown, N. J.	96	50	94	54	87	38	81	31	72	18	54	-11
Morrison, Ill.	96	50	( )	( )	( )	( )	( )	( )	60	5	( )	( )
Morrilton, Dak.	106	50	98	42	74	28	( )	( )	( )	( )	( )	( )
Mottville, Mich.	( )	( )	96	46	90	34	80	30	63	15	37	-11
Mountainville, N. Y.	93	48	90	39	84	31	83	20	70	15	54	-11
Mount Forest, Canada	81	46	84	47	79	25	58	23	61	4	44	-11
Mount Ida, Ark.	99	56	90	50	94	33	90	33	76	20	78	-11
Mount Vernon, Iowa	99	58	( )	( )	90	40	70	26	60	Zero.	54	-11
Murfreesborough, Tenn.	91	63	( )	( )	( )	( )	( )	( )	72	18	60	-11
Muscataine, Iowa	93	48	89	43	90	33	86	26	66	4	60	-11
Nebraska City, Nebr.	95	60	( )	( )	( )	( )	( )	( )	( )	( )	60	-11
Neillsville, Wis.	97	42	90	41	82	24	80	19	66	6	47	-11
Nephi, Utah.	93	63	93	( )	85	30	64	19	66	5	51	-11
Newark, N. J.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
New Bedford, Mass.	85	57	84	52	80	47	70	39	61	13	54	-11
New Market, N. H.	94	48	( )	( )	( )	( )	( )	( )	70	13	73	-11
Newport, Fla.	( )	( )	94	70	92	59	92	54	79	13	75	-11
Newport, Vt.	84	46	80	37	80	37	76	30	67	6	45	-11
New Tacoma, Wash.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
New Ulm, Tex.	101.5	58	103	66	83	33	94	45	96	36	78	-11
Noblesville, Ind.	90	65	90	49	( )	( )	( )	( )	( )	( )	48	-11
Nora Springs, Iowa	92	47	98	42	86	32	80	38	60	2	48	-11
Northfield, Minn.	94	44	87	44	81	29	78	19	68	Zero.	54	-11
North Lewisburg, Ohio.	92	52	92	48	89	36	83	30	68	9	54	-11
Northport, Mich.	81	58	82	58	80	42	70	33	30	16	54	-11
North Valley, N. Y.	88	53	92	53	81	36	88	25	68	17	53	-11
Oakland, Cal.	85	53	85	51	98	52	77	43	34	34	78	-11
Oakwood, Cal.	95	60	100	59	105	56	82	46	94	36	78	-11
Ogreeta, N. C.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Ore Knob, N. C.	88	56	87	48	80	33	76	19	58	9	48	-11
Orono, Me.	86	51	84	38	80	33	76	19	58	9	48	-11
Oskaloosa, Iowa	( )	( )	86	57	( )	( )	( )	( )	( )	( )	( )	( )
Ottumwa, Iowa.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Palermo, N. Y.	86	54	82	50	79	35	80	31	63	16	46	-11
Parimaribo, Dutch Guiana, S. A.	89	69	91	69	93	70	94	68	93	79	82	6
Paris, Tenn.	90	60	88	64	90	50	86	34	70	24	53	Zero.
Paterson, N. J.	97	60	90	57	78	49	86	34	70	11	63	-11
Peoria, Ill.	98	62	95	50	90	41	83	34	70	7	59	-11
Pera, Nebr.	98	57	93	54	90	41	81	28	63	17	54	-11
Phillipsburg, N. J.	98	57	84	46	71	33	76	30	63	15	54	-11
Pierce City, Mo.	98	51	99	59	93	33	87	37	78	15	54	-11
Pleasant Grove, Wash.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Point Lobos, Cal.	70	49	71	49	84	50	65	46	66	30	50	-11
Point Pleasant, La.	86	70	97	64	100	54	74	32	62	Zero.	54	-11
Polo, Ill.	98	47	90	43	85	31	79	37	67	15	54	-11
Port Jervis, N. Y.	90	58	87	46	80	36	78	28	67	11	53	-11
Portsmouth, Ohio	95	64	98	49	82	43	84	33	77	16	58	-11
Poway, Cal.	83	62	94	61	102	56	81	43	63	18	58	-11
Prairie du Chien, Wis.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Princeton, Cal.	107	66	102	52	106	53	85	38	72	24	60	-11
Princeton, Mass.	87.3	46	87	46	80	33	78	27	63	16	54	-11
Princeton, N. J.	107	56	103	52	103	53	83	33	63	16	54	-11
Providence, R. I.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Pueblo, Colo.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Puerto de Luna, N. Mex.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Pulaski, Tenn.	82	65	( )	( )	91	47	86	36	71	17	53	-11
Quakertown, Pa.	90	49	96	50	79	37	77	23	66	16	54	-11
Quitman, Ga.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Raleigh, N. C.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Randolph, Vt.	81	43	80	41	80	41	74	35	60	30	43	-11
Rapid City, Dak.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Readington, N. J.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Receiving Reservoir, D.C.	96	64	96	56	87	48	86	33	73	17	62	-11

<sup>1</sup>No record.

*Fahrenheit) reported by voluntary observers of the Signal Service, &c.—Continued.*

1884.

January.		February.		March.		April.		May.		June.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
46	-10	48	5	53	4	72	32	84	30	90.5	55.5	107
42	-4	53	0.2	58	3	84	28	88	40	88	51	98
48	-21.5	( )	( )	( )	( )	( )	( )	82	41	97	46	105
67	( )	72	13	76	24	84	31	87	46	92	56	108
( )	( )	( )	( )	79	21	( )	( )	88	50	88	52	.....
46	-4	66	1	59	1.5	68	26	85	36	90	44	108
50	-12	55	Zero.	( )	( )	( )	( )	( )	( )	( )	( )	127
38	-33	39	-18	58	-16	72	21	82	35	87	48	129
42	-33	44	-12	68	-8	80	18	83	34	93	44	.....
46	0.5	66	8	68	8	74	32	90	41	( )	( )	108
( )	( )	( )	( )	( )	( )	( )	( )	80	27	88	50	.....
( )	( )	( )	( )	70	-10	78	26	85	30	98	50	.....
49	-24	55	-7	60	-5	81	28	78.2	34	89	50	.....
49	-15	55	-1	61	-8	78	22	( )	( )	97	37	.....
40	-23	41	-11	49	-23	68	18	77	31	87	48	110
72	2	76	10	78	30	84	37	84	48	94	50	101
45	-25	46	-8	65	-8	84	25	88	41	94	53	.....
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
45	-23	45	-4	66	-3	82	25	81	36	89	45	121
( )	( )	30	-14	66	-5	( )	( )	( )	( )	( )	( )	.....
36	-36	25	-25	55	-24	60	18	75	29	80	36	128
47	-12	49	-16	52	18	68	25	80	30	91	40	.....
54	9	58	-9	62	8	74	37	( )	( )	( )	( )	.....
46	1	55	5	( )	( )	( )	( )	( )	( )	( )	( )	.....
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
69	18	70	32	80	36	83	45	( )	( )	( )	( )	.....
48	-20	43	-4	54	-24	73	24	80	38	92	44	121
55	25	( )	( )	61	23	( )	( )	( )	( )	78	52	.....
78	12	70	32	84	38	86.5	40.5	79	61.5	95	62	91
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
40	-28	30	-18	62	-12	( )	( )	( )	( )	( )	( )	.....
41	-29	34	-19	63	-12	71	18	80	31	89	43	128
49	-23.5	50	2	65	2	78	27	84	34	94.5	50	118
37	4	43	2	50	3	70	28	76	37	88	52	90
41	6	45	3	58	2	74	26	( )	( )	89	53	.....
60	21	73	28	67	38	70	48	81	46	78	54	.....
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
50	3	61	11	70	19	66	40	73	37	77	66	.....
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
48	-29	44	-5.4	50	-14	65.9	28.8	75.5	34.1	88.6	38.2	117.6
54	-29	( )	( )	65	-4	( )	( )	80	38	89	55	.....
49	-3.5	( )	( )	71	-2	79.6	27.4	83	38	90	54.5	.....
46	-10	42	Zero.	49	Zero.	71	25	85	33	89	54	108
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
48	Zero.	52	5	69	6	73	33	87	40	( )	( )	.....
49	-27	49	5	67	Zero.	85	31	84	44	94	50	125
54	-23	55	2	70	1	( )	( )	80	39	87	56	.....
42	-10	58	3	64	4	( )	( )	( )	( )	92	54	.....
63	9	70	6	73	18	80	28	89	35	92	48	108
( )	( )	( )	( )	63	3	75	29	85	32	89	36	.....
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
39	-33	39	-12	65	-7	( )	( )	82	30	95	46	.....
38	-3	50	2	57	1	( )	( )	87	39	92	52	.....
58	-16	68	5	59	8	84.5	32	90	41	93	52.5	111
78	81	( )	( )	71	40	74	48	79	52	97	56	.....
( )	( )	( )	( )	( )	( )	( )	( )	83	42	89	52	.....
65	28	75	22	74	37	75	38	89	46	92	52	85
40	6.5	52	2	50	3	63	20	81.5	27	89.7	41	107.7
( )	( )	( )	( )	( )	( )	( )	( )	87.5	32	95	40	.....
60	-11	66	-13	70	16	74	30	83	38	90	54	.....
( )	( )	( )	( )	81	19	( )	( )	90	43	( )	( )	.....
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	.....
42	52	( )	( )	82	2	68	28	81	37	88	41	92
70	17	( )	( )	59	41	( )	( )	( )	( )	( )	( )	.....
63	2	( )	( )	50	Zero.	( )	( )	85	50	( )	( )	.....
( )	( )	( )	( )	62	-11	( )	( )	( )	( )	( )	( )	.....
46	-5	45	36	56	6	70	36	90	46	100	52	.....
44	Zero.	54	16	62	6	( )	( )	( )	( )	( )	( )	.....
51	4	72	10	67	13	88	33	92	44	94	52	82

1 No record.

*Maximum and minimum temperatures and annual range of temperature (in degrees)*

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Red Willow, Nebr.	104	52	102	52	92	36	88	24	70	10	60	20
Reed City, Mich.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Richardton, Dak.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Richmond, Ky.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Riddleton, Tenn.	91	57	89	54	90	45	85	42	82	17	70	20
Riley, Ill.	93	46	90	47	86	36	78	30	60	11	50	11
Ripon, Wis.	90	47	88	46	83	32	80	30	63	Zero.	58	11
Rising Sun, Ind.	92	58	90	53	86	42	82	25	(1)	19	70	19
Rock Creek Bridge, D. C.	98	66	93	63	86	50	86	41	76	19	62	19
Rockford, Ill.	95	54	89	53	83	39	80	28	61	6	53	11
Rogersville, Tenn.	89	63	90	61	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Rowe, Mass.	87	50	84	37	76	36	76	18	67	9	51	11
Ruggles, Ohio.	95	55	90	50	85	38	73	31	64	12	52	11
Sacramento, Cal.	102	51	96	50	96	47	80	25	71	25	67	11
Saint Louis, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Salom, Ind.	(1)	(1)	(1)	(1)	89	48	(1)	(1)	(1)	(1)	(1)	(1)
Salem, N. J.	(1)	(1)	(1)	(1)	82	42	(1)	(1)	(1)	(1)	(1)	(1)
Salina, Kans.	89.5	65	90	56	82	52	78	38	64	20	49	11
Salinas City, Cal.	74	54	78	52	101.5	50	76	38	75	29	75	11
Sandwich, Ill.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sandy Springs, Md.	95	56	92	52	85	40	78	31	73	14	58	12
San Raphael, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Santa Barbara, Cal.	(1)	(1)	(1)	(1)	98	57	75	47	(1)	(1)	(1)	(1)
Savannah, Tenn.	90	61	91	55	91	45	87	44	76	17	(1)	(1)
Sherlock, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Smithville, Tenn.	88	64	86	59	86	50	82	42	71	12	(1)	(1)
Snowville, Va.	92	50	88	49	80	39	80	34	70	11	62	13
Somerset, Mass.	97	50	90	44	87	38	82	24	65	14	58	11
Somerville, N. J.	94	61	89	55	84	42	80	32	62	16	54	11
South Bend, Ind.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Southington, Conn.	96	56	89	46	84	32	82	22	65	12	52	11
South Orange, N. J.	92	59	90	50	84	44	84	34	72	18	54	11
Speedland, Ind.	92	49	91	46	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Springfield, Ark.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Springfield, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Stateburg, S. C.	98	68	95	80	92	56	88	49	79	24	72	11
State College, Pa.	89	49	85	47	78	34	74	27	66	12	60	11
Statesville, N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Stella, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	67	10	64	11
Stockholm, Nebr.	96	66	92	60	90	48	83	40	70	30	68	11
Stratford, Vt.	88	54	86	46	80	40	74	26	66	8	58	11
Sumner, Ind.	(1)	(1)	93	50	90	35	80	34	72	8	64	11
Sussex, Wis.	92	50	88	42	85	36	79	27	60	Zero.	52	11
Swanwick, Ill.	92	59	94	58	90	44	87	33	71	14	58	11
Swartz Creek, Mich.	88	52	92	48	88	37	79	26	64	5	55	11
Sycamore, Ill.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Syracuse, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Table Rock, Nebr.	98	62	(1)	(1)	98	(1)	86	26	65	4	60	11
Tallahassee, Fla.	(1)	(1)	92	71	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Tamaqua, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Taunton, Mass.	94	(1)	90	(1)	85	33	88	21	66	11	55	11
Terre Haute, Ind.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Thorntonville, Mich.	91	47	94	42	85	34	80	29	65	6	56	11
Topeka, Kans.	99	63	95	54	94	47	86	25	74	13	73	11
Traverse City, Mich.	86	53	88	43	85	33	68	24	56	9	54	11
Trenton, Tenn.	90	61	88	59	88	41	84	40	73	16	(1)	(1)
Troy, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Utica, Nebr.	(1)	(1)	99	48	95	38	(1)	(1)	(1)	(1)	64	11
Variety Mills, Va.	97	54	94	50	86	46	82	36	74	12	64	11
Vermilion, Dak.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Vevay, Ind.	95	55	92	54	95	55	92	54	92	45	63	11
Vineland, N. J. (F. T. Hill)	(1)	(1)	(1)	(1)	(1)	(1)	70	31	77	16	58	11
Vineyard, N. J.	98	56	92	50	84	40	82	32	76	20	62	11
Voluntown, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Warrenton, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Waba h, Ind.	89	60	90	53	82	35	79	37	64	10	50	11
Washington, D. C.	96	60	95	52	86	44	(1)	(1)	(1)	(1)	(1)	(1)
Wausau, Wis.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Wauseon, Ohio.	92	43	93	41	89	29	85	28	66	6	56	11
Waverly, Tenn.	89	60	(1)	(1)	86	42	86	41	76	16	(1)	(1)
Weaverville, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Webster, Dak.	108	49	100	44	96	25	83	13	75	19	68	11
Websterville, Ohio.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Weldon, N. C.	102	62	98	54	96	52	88	45	81	20	67	11
Wellington, Kans.	97	56	98	51	93	42	90	31	75	12	65	11

(1) No record.

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*Maximum and minimum temperatures and annual range of temperature (in degrees*

Stations.	1883.											
	July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Wellsborough, Pa. ....	92	45	93	42	81	28	78	19	67	14	57	3
Wellsburg, W. Va. ....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Wentworth, Dak. ....	(1)	(1)	(1)	(1)	82	25	(1)	(1)	(1)	(1)	(1)	(1)
West Bend, Iowa. ....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Westborough, Mass. ....	96	44	91	46	85	30	84	19	74	16	56	—17
West Chester, Pa. ....	91	57	89	52	81	40	78	33	64	17	54	5
Westerville, Ohio. ....	91	47	91	43	86	34	81	33	70	20	58	8
West Leavenworth, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	75	20	63	—2
Westmoreland, Kans. ....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
White Bluff, Tenn. ....	95	60	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
White Plains, N. Y. ....	87	60	82	53	78	45	80	31	67	17	48	7
Wilkesbarre, Pa. ....	92	43	82	41	84	31	80	22	70	12	54	5
Williamstown, Mass. ....	81	61	76	56	(1)	34	69	25	(1)	(1)	(1)	—20
Woodstock, Md. ....	94	54	92	50	82	41	74	28	70	13	68	10
Woodstock, Vt. ....	90	39	89	36	83	29	77	14	69	7	47	—32
Worcester, Mass. ....	87	54	84	45	77	39	79	25	64	17	53	—13
Wyandotte, Kans. ....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Wytheville, Va. ....	90	61	86	46	81	43	90	34	68	10	(1)	(1)
Yates Centre, Kans. ....	97	57	94	54	83	38	90	28	76	9	72	1

<sup>1</sup> No record.

*Fahrenheit) reported by voluntary observers of the Signal Service, &c.—Continued.*

1884.												Annual range.
January.		February.		March.		April.		May.		June.		
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
42	-24	48	-10	(1)	(1)	72	26	84	40	95	50	.....
(1)	-14	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
40	-28	39	-18	68	-12	(1)	(1)	(1)	(1)	(1)	(1)	.....
46	-8	60	5	60	-8	65	28	93	37	100	35	117
48	3	60	5	60	4	71.5	31	86	38	90.5	45	88
(1)	(1)	(1)	(1)	65	-4	79	27	86	33	91	49	.....
55	-26	60	1	74	12	78	30	86	40	(1)	(1)	.....
(1)	(1)	(1)	(1)	(1)	(1)	80	21	85	34	95	46	.....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
41	-1	48	-2	60	2	70	28	82	28	85	51	80
50	-9	50	-1	60.9	-2.5	76.1	26	91	32	(1)	(1)	.....
39	-6.8	49	4	49.9	-2.1	67.5	27.7	80.7	31	(1)	(1)	.....
48	-2	68	5	65	5	80	28	91	38	91	41	96
45	-36	52	-5	54	-16	75	17	85	25	96	36.3	132
42	-1	56	1	52	2	(1)	(1)	80	33	86	47	.....
(1)	(1)	(1)	(1)	70	9	73	28.5	81	40	90	55	.....
56	-2	72	2	69	11	81	26	88	37	85	43	.....
60	-22.5	62	-4	76	6	77	26.4	83	32.5	(1)	(1)	.....

<sup>1</sup> No record.

## APPENDIX 43.

Table showing the monthly and annual mean temperature (in degrees Fahrenheit) at military post hospitals for the year ending June 30, 1884.

[The daily mean is obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. observations by four; the monthly mean by dividing the sum of the daily means by the number of days in the month.]

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Abraham Lincoln, Fort Dak	69.2	68.8	68.9	68.8	68.8	68.8	68.8	68.8	68.8	68.8	68.8	68.8
Alexandra Island, Cal	55.1	55.2	55.3	55.4	55.5	55.6	55.7	55.8	55.9	56.0	56.1	56.2
Apache, Fort Ariz	70.2	69.4	68.8	68.2	67.6	67.0	66.4	65.8	65.2	64.6	64.0	63.4
Assiniboine, Fort Mont.	68.6	68.9	69.2	69.5	69.8	70.1	70.4	70.7	71.0	71.3	71.6	71.9
Barranca, Fort Fla	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Benicia Barracks, Cal	65.7	67.4	70.3	68.2	66.1	64.0	61.9	59.8	57.7	55.6	53.5	51.4
Bitwell, Fort Cal	78.8	77.2	75.0	72.8	70.6	68.4	66.2	64.0	61.8	59.6	57.4	55.2
Bowie, Fort Ariz	78.1	77.6	77.0	76.4	75.8	75.2	74.6	74.0	73.4	72.8	72.2	71.6
Brady, Fort Mich	60.0	59.7	59.4	59.1	58.8	58.5	58.2	57.9	57.6	57.3	57.0	56.7
Bridger, Fort Wyo	65.2	62.6	60.0	57.4	54.8	52.2	49.6	47.0	44.4	41.8	39.2	36.6
Buford, Fort Dak	69.0	64.9	60.8	56.7	52.6	48.5	44.4	40.3	36.2	32.1	28.0	23.9
Cahoon, Fort Wash T	61.1	60.4	60.0	59.6	59.2	58.8	58.4	58.0	57.6	57.2	56.8	56.4
Columbus, Fort N. Y. H	74.2	71.8	69.4	67.0	64.6	62.2	59.8	57.4	55.0	52.6	50.2	47.8
Concho, Fort Tex	82.5	85.7	88.9	92.1	95.3	98.5	101.7	104.9	108.1	111.3	114.5	117.7
Cochise, Fort N. Y.	74.0	70.8	68.2	65.6	63.0	60.4	57.8	55.2	52.6	50.0	47.4	44.8
David, Fort Tex	73.8	72.9	72.0	71.1	70.2	69.3	68.4	67.5	66.6	65.7	64.8	63.9
Ellis, Fort Mont	63.8	63.5	63.2	62.9	62.6	62.3	62.0	61.7	61.4	61.1	60.8	60.5
Far Steele, Fort Wyo	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Gardner, Fort Colo	64.5	62.0	60.0	58.0	56.0	54.0	52.0	50.0	48.0	46.0	44.0	42.0
Gaston, Fort Ariz	74.9	70.8	64.0	58.2	52.4	46.6	40.8	35.0	29.2	23.4	17.6	11.8
Grant, Fort Cal	75.1	73.8	71.7	69.2	66.7	64.2	61.7	59.2	56.7	54.2	51.7	49.2
Hale, Fort Dak	70.0	69.9	69.5	69.0	68.5	68.0	67.5	67.0	66.5	66.0	65.5	65.0
Hamilton, Fort N. Y. H	75.0	71.0	65.4	59.8	54.2	48.6	43.0	37.4	31.8	26.2	20.6	15.0
Jefferson Barracks, Mo	76.7	74.8	72.3	69.7	67.1	64.5	61.9	59.3	56.7	54.1	51.5	48.9
Keogh, Fort Mont.	67.2	67.8	68.4	69.0	69.6	70.2	70.8	71.4	72.0	72.6	73.2	73.8
Lamar, Fort Idaho	63.6	59.2	54.8	50.4	46.0	41.6	37.2	32.8	28.4	24.0	19.6	15.2
Lapwai, Fort Ore	75.2	74.2	73.2	72.2	71.2	70.2	69.2	68.2	67.2	66.2	65.2	64.2
Leavenworth, Fort Kans	77.9	74.0	69.6	65.2	60.8	56.4	52.0	47.6	43.2	38.8	34.4	30.0
Lowell, Fort Colo	65.6	63.6	61.6	59.6	57.6	55.6	53.6	51.6	49.6	47.6	45.6	43.6
Lyon, Fort Ariz	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Madison, Fort Colo	64.8	63.6	62.4	61.2	60.0	58.8	57.6	56.4	55.2	54.0	52.8	51.6
Madison Barracks, N. Y	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Madison, Fort Mont	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Madison, Fort Dak	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5

[illegible]

**No record.**

## APPENDIX 44.

Table showing the maximum, minimum, and annual range of temperature (in degrees

[From self-rec-

Stations.	1883.									
	July.		August.		September.		October.		November.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Abraham Lincoln, Fort, Dak.	94	43	92	42	93	16	74	17	69	3
Alcatraz Island, Cal.	69	50	60	50	82	52	72	49	73	3
Angel Island, Cal.	82	50	85	50	99	50	88	46	75	19
Apache, Fort, Ariz.	97	51	92	50	96	37	79	22	72	16
Assinaboine, Fort, Mont.	97	40	93	36	86	25	63	17	65	26
Barrancas, Fort, Fla.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Benicia Barracks, Cal.	101	53	101	54	100	55	85	45	75	37
Bidwell, Fort, Cal.	90	50	87	43	85	38	76	27	68	13
Bowie, Fort, Ariz.	103	60	96	61	94	47	85	34	77.2	31.5
Brady, Fort, Mich.	78	39	79	36	72	25	66	18	61	-10
Bridger, Fort, Wyo.	89	32	88	26	80	19	68	11	56	2
Buford, Fort, Dak.	99	40	96	36	91	16	73	-1	59	-25.5
Canby, Fort, Wash T.	74	45	75	45	86.4	48.5	60.2	40.2	56.8	31.5
Columbus, Fort, N. Y. H.	90	59	89	57	82	45	78	26	67	22
Concho, Fort, Tex.	104	65	98	66	98	43	96	35	87	10
David's Island, N. Y.	93	58	90	53	83	44	82	32	66	21
Davis, Fort, Tex.	97	58	97	53	94	37	87	37	81.6	25.1
Ellis, Fort, Mont.	95	38	93	26	87	33	73	10	61	-5
Fred. Steele, Fort, Wyo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Garland, Fort, Colo.	85	38	82	38	81	23	67	9	(1)	(1)
Gaston, Fort, Cal.	105	44	100	43	98	39	78	34	66	28
Grant, Fort, Ariz.	95.4	61.8	91.2	61.2	91.7	51	84.3	36.4	67.3	26.1
Hale, Fort, Dak.	97	48	96	45	90	29	80	17	65	3
Hamilton, Fort, N. Y. H.	92	54	90	52	84	42	73	35	78	21
Jefferson Barracks, Mo.	98	59	97	50	92	42	86	35	72	18
Keogh, Fort, Mont.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Klamath, Fort, Oreg.	92	32	90	25	92	20	74	9	65	11
Lapwai, Fort, Idaho.	106	41	108	38	98	32	71	25	63	22
Leavenworth, Fort, Kans.	99	58	93	54	92	42	85	34	73	16
Lewis, Fort, Colo.	65.5	45	63.6	46	56.6	29	73	7	59	6
Lowell, Fort, Ariz.	(1)	(1)	(1)	(1)	(1)	(1)	94	26	89	25
Lyon, Fort, Colo.	(1)	(1)	101	51	92	35	86	20	76	7
Madison Barracks, N. Y.	83	44	90	41	80	28	84	18	66	6
Maginnis, Fort, Mont.	87	43	90	30	84	20	62	14	60	-10
Mason, Fort, Cal.	86	56	86	50	84	50	70	48	67	42
McDermitt, Fort, Nev.	111	62	100	62	94	52	69	29	64	19
McDowell, Fort, Ariz.	108	64	113	66	111	53	97	32	86	20
McHenry, Fort, Md.	92	58	89	60	78	45	82	38	69	21
Meade, Fort, Dak.	98	35	98	38	94	27	76	14	71	7
Mitchell, Camp, Ga.	(1)	(1)	96	(1)	95	(1)	91	(1)	78	(1)
Mojave, Fort, Ariz.	112	63	112	72	111	61	95	46	84	34
Monroe, Fort, Va.	95	65	93	60	82	58	83	45	75	25
Mount Vernon Barracks, Ala.	99	66	99	61	96	53	98	39	84	27
Niagara, Fort, N. Y.	86	50	89	48	83	36	78	29	67	30
Niobrara, Fort, Nebr.	109	45	103	40	92	30	89	24	86	-2
Pembina, Fort, Dak.	93	39	86	38	86	11	76	10	57	-23
Plattsburg Barracks, N. Y.	89	48	85	42	79	35	70	20	73	8
Preble, Fort, Me.	88	57	84	51	78	42	75	28	62	16
Presidio, Cal.	76	43	84	49	95	48	83	43	72	37
Randall, Fort, Dak.	99	45	99	40	92	32	82	19	69	-1
Reno, Fort, Ind. T.	97	56	96	57	95	40	92	28	82	17
Robinson, Fort, Nebr.	103	40	94	37	94	28	84	14	71	5
Saint Augustine, Fla.	95	69	92	69	88	62	94	60	82	45
Shaw, Fort, Mont.	94	30	87	36	83	28	60	5	58	-21
Sisseton, Fort, Dak.	95	40	90	40	86	19	71	15	57	-15
Snelling, Fort, Minn.	98	48	96	42	85	22	75	21	59	Zero
Spokane, Fort, Wash T.	102	42	100	35	88	30	74	22	60	14
Sully, Fort, Dak.	101	50	90	48	99	29	84	24	69	-1
Totten, Fort, Dak.	88	45	88	43	92	12	74	16	53	-16
Townsend, Fort, Wash T.	87	44	77	43	74	39	60	32	59	27
Union, Fort, N. Mex.	90	44	85	42	86	27	75	15	71	5
Verde, Fort, Ariz.	103	60	101	63	103	46	86	30	75.5	23
Warren, Fort, Mass.	88	57	83	55	77	47	72	37	60	23
Washakie, Fort, Wyo.	(1)	(1)	92	32	81	24	(1)	(1)	(1)	(1)
West Point, N. Y.	95	50	89	46	87	33	83	27	(1)	(1)
Wingate, Fort, N. Mex.	88	47	84	50	83	86	72	18	64	18
Yates, Fort, Dak.	98	42	90	42	96	25	78	11	64	-10

<sup>1</sup> No record.

## APPENDIX 44.

*Fahrenheit) at military post hospitals, from July, 1883, to June, 1884, inclusive.*

tering thermometer.]

1883.				1884.										Annual range.
December.		January.		February.		March.		April.		May.		June.		
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	-31	40	-45	44	-35	60	-18	72	15	84	29	92	42	189
63	39	58	39	70	29	66	41	65	44	73	47	75	49	53
77	37	71	38	77	28	82	43	77	33	93	49	88	52	71
61.5	15	59.8	6	69.2	8.2	66.2	15.3	77	24.8	85.3	31	95.3	38.1	91
55	-24	45	-31	44	-40	55	-32	75	12	88	27	101	44	141
(1)	(1)	74	10	85	27	85	84	86	43	93	61	96	61	-----
64	32	61	34	73	28	72	40	73	44	86	51	82	55	78
71	2	56	5	67	-19	63	15	77	25	78	26	81	37	109
68.5	25.5	67.5	1	68.7	18.5	72.5	32	85	25	101	40	103	51.5	102
44	-16	36	-32	38	-29	57	-28	69	17	74	29	91	36	123
46	-7	44	-15	44	-39	47	Zero.	57	14	73	20	84	30	128
46	-34	44	-43	45	-43	58.8	-22.7	76	10	85.5	25.2	100	34	143
57	29.6	55	32.3	68	16	64.2	33.5	78.2	40.9	76	42.6	68	47.6	70.4
54	4	45	6	56	6	62	7	(1)	(1)	85	42	92	49	-----
82	Zero.	73	5	82	17	89	26	95	32	95	44	100	53	104
52	-4	47	4	54	3	61	4	67	30	86	39	93	44	97
75	12	73.1	6	76.2	20	77.1	30.1	80.1	27	87.9	40	97	52	91
55	-18	48	-17	50	-26	54	-14	70	20	82	20	93	30	122
(1)	(1)	(1)	(1)	(1)	(1)	55	-2	68	12	80	16	93	36	-----
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-----
55	29	62	26	74	20	72	83	80	88	95	36	90	42	85
65	23.6	59.4	18.8	72.7	20.3	66.2	30.2	77.7	32.4	86.7	38.6	99	58.1	80.2
55	-22	48	-32	49	-34	68	-15	75	21	86	32	(1)	(1)	-----
50	Zero.	50	-2	54	-5	62	5	70	81	85	42	91	45	97
70	5	62	-22	66	1	70	5	80	80	85	42	94	50	120
(1)	(1)	45	-32	55	-38	68	-25	78	12	(1)	(1)	(1)	(1)	-----
52	Zero.	45	-5	56	-30	56	6	70	20	82	21	85	31	123
55	2	47	4	55	-24	64	19	80	31	92	36	(1)	(1)	-----
65	4	57	-21	57	-1	70	11	75.8	29	84	39	90.8	52	130
68	-14	50	-14	48	-21	51	-1	60	13	71	22	84	35	106
76	28	78	12	86	20	86	33	91	84	(1)	(1)	(1)	(1)	-----
68	2	66	-7	69	-23	80	9	80	23	91	17	98	47	-----
50	-18	41	-29	51	-3	52	-3	73	12	81	31	90	40	119
58	-14	48.1	-20.3	51.1	-28.2	53.1	-14.1	65.8	16.9	78.4	29.6	87.6	43.4	118.2
57	40	59	41	68	29	73	48	73	50	78	50	75	50	87
82	-8	49	-2	49	-18	53	22	56	31	62	35	84	40	129
78	29	71	23	85.3	23.7	79.9	36.5	92	37	102.2	43.5	118	50	93
55	10	50	6	64	8	62	13	77	32	87	45	81	51	86
69	-11	54	-21	57	-28	66	-11	73	12	82	25	97	38	126
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-----
72	35	71	82	78	27	(1)	(1)	92	44	100	58	(1)	(1)	-----
69	23	63	8	67	27	72	20	77	38	88	50	89	55	92
76	22	74	10	80	24	84	33	87	40	92	55	96	54	89
57	2	47	-9	57	-3	55	-2	72	26	79	32	86	44	98
62	-14	50	-22	64	-38	70	-10	(1)	(1)	(1)	(1)	(1)	(1)	-----
45	-35	34	-35	34	-37	89	-26	66	9	83	29	(1)	(1)	-----
52	-19	45	-27	49	-3	51	-5	66	15	79	36	88	40	116
50	-6	45	-3	45	7	50	-2	60	27	(1)	(1)	(1)	(1)	-----
64	35	62	37	73	28	73	38	70	41	85	42	70	47	67
64	-18	48	-29	53	-29	70	-12	74	22	89	33	96	40	128
77	15	69	-4	72	3	(1)	(1)	85	31	89	37	96	55.4	-----
60	-11	51	-22	56	-39	(1)	(1)	76	10	88	26	(1)	(1)	-----
79	30	77	22	83	42	85	40	86	45	90	62	91	63	78
57	-9	51	-15	53	-32	55	-22	71	21	81	27	91	45	126
52	-27	45	-44	42	-29	46	-23	65	16	79	27	89	44	139
50	-24	43	-33	37	-25	61	-20	74	18	83	31	99	35	132
52	-12	51	-5	49	-32	65	-3	77	29	91	30	95	37	134
60	-16	52	-30	57	-30	72	-6	75	20	88	33	99	47	131
40	-31	35	-39	28	-31	42	21	65	10	82	29	96	45	135
60	19	57	25	57	-8	60	26	72	36	80	36	(1)	(1)	-----
66	2	66	-13	67	-21	63	9	72	15	79	12	88	38	111
66	28.5	63	15.5	71.5	15	68.5	27.5	85	30	98.5	38	106.5	42	91.5
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-----
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-----
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-----
57	11	(1)	7	66	-8	59	11	69	18	77	26	87	34	96
55	-31	42	-44	49	-38	56	-14	79	19	83	34	97	48	142

1 No record.

## APPENDIX 45.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending June 30, 1884, copied from the records on file at the office of the chief engineer, Central Pacific Railroad, by the observer at San Francisco, Cal.

[The daily means are obtained by dividing the sum of the 7 a. m., 3 p. m., and 9 p. m. observations by three, the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	1883.						1884.						Annual means.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Alta, Cal.	78.4	71.2	70.4	50.5	47.2	44.4	42.2	38.4	42.2	47.0	52.0	61.3	54.5
Anaheim, Cal.	74.3	75.9	77.7	67.2	62.0	51.8	57.0	60.4	63.2	65.0	69.2	61.3	64.5
Antioch, Cal.	72.7	71.8	73.1	58.0	47.4	40.7	43.5	44.8	43.7	55.2	64.6	77.6	63.3
Auburn, Cal.	78.2	75.2	72.0	55.7	50.0	45.0	45.3	43.8	43.7	51.9	62.1	63.5	57.3
Battle Mountain, Nev.	78.8	73.0	65.7	44.4	39.0	29.5	26.9	21.0	40.1	48.7	61.9	63.2	49.8
Benson, Ariz.	85.5	80.4	82.2	69.1	57.2	50.0	45.4	54.1	57.0	64.1	75.4	(1)	63.2
Beowawe, Nev.	77.8	74.9	67.0	43.5	38.0	29.3	25.6	24.1	37.6	44.3	57.6	64.6	48.9
Bishop's Creek, Nev.	70.6	73.6	(1)	(1)	(1)	33.9	(1)	23.5	45.4	57.4	65.8	63.9	50.8
Blue Creek, Utah	80.2	84.8	83.6	48.4	40.9	37.6	22.5	23.0	39.8	45.8	60.4	69.2	50.8
Boca, Cal.	88.7	86.8	85.5	41.0	32.4	29.4	22.6	13.7	30.0	37.4	49.0	56.2	40.6
Borden, Cal.	70.6	75.6	75.8	64.4	56.8	50.2	49.2	52.0	59.8	60.1	63.8	60.5	63.2
Brentwood, Cal.	76.9	74.6	75.8	61.8	53.6	43.7	45.5	44.4	53.6	54.4	64.0	64.7	60.1
Brighton, Cal.	86.5	81.6	74.2	60.4	51.5	45.8	47.2	43.4	54.0	57.8	68.9	63.3	60.5
Brown's, Nev.	83.9	85.4	83.8	52.0	43.5	33.5	30.8	30.4	44.0	52.6	63.0	74.1	56.0
Byron, Cal.	82.9	85.4	83.8	52.0	43.5	33.5	30.8	30.4	44.0	52.6	63.0	74.1	56.0
Caliente, Cal.	75.7	70.7	72.4	57.7	47.4	42.0	47.7	45.6	54.8	55.2	70.0	70.9	63.6
Calistoga, Cal.	(1)	(1)	(1)	53.5	47.4	44.8	45.3	45.6	50.8	55.2	64.8	67.2	58.1
Camp Wright, Cal.	74.2	68.9	60.9	39.8	31.5	25.0	17.9	17.9	34.2	42.5	55.4	62.9	44.3
Carlin, Nev.	83.4	82.5	82.5	73.7	66.5	58.0	53.2	54.6	59.1	69.1	80.5	83.6	72.4
Casa Grande, Ariz.	81.1	86.7	79.2	63.0	51.1	45.5	46.6	44.4	53.8	60.7	71.2	70.2	63.7
Chico, Cal.	86.0	80.6	80.6	55.2	51.9	50.8	48.8	49.5	51.5	54.3	67.7	57.7	57.7
Chualar, Cal.	86.7	82.5	84.1	43.2	37.7	27.2	32.8	49.5	31.2	34.8	43.4	51.0	44.6
Colfax, Cal.	80.9	74.4	72.4	43.2	49.9	47.5	45.8	44.1	46.9	49.9	63.6	63.0	57.8
Colton, Cal.	71.0	70.4	55.7	53.4	56.8	(1)	49.6	55.3	41.2	59.1	66.0	63.0	53.3
Cortina, Utah	84.9	80.9	77.3	48.6	35.9	22.1	22.9	20.5	39.2	49.5	61.4	72.5	53.3
Deer Creek, Ariz.	84.9	80.9	77.3	48.6	35.9	22.1	22.9	20.5	39.2	49.5	61.4	72.5	53.3
Delta, Cal.	84.9	80.9	77.3	48.6	35.9	22.1	22.9	20.5	39.2	49.5	61.4	72.5	53.3
Delano, Cal.	84.9	80.9	77.3	48.6	35.9	22.1	22.9	20.5	39.2	49.5	61.4	72.5	53.3
Donnerstag, Ariz.	84.9	80.9	77.3	48.6	35.9	22.1	22.9	20.5	39.2	49.5	61.4	72.5	53.3
Donnerstag, N. Mex.	84.9	80.9	77.3	48.6	35.9	22.1	22.9	20.5	39.2	49.5	61.4	72.5	53.3

Danville, Cal.	85.3	80.4	65.5	58.4	44.5	48.6	49.3	56.9	41.6	58.5	71.9	64.7
El Paso, Tex.	76.3	70.5	65.2	58.1	46.0	29.6	18.0	52.3	45.6	58.1	63.8	46.1
El Paso, Tex.	84.3	76.5	65.2	48.5	46.0	39.5	41.4	52.3	45.6	58.1	63.8	46.1
Emigrant Gap, Cal.	72.7	68.2	64.0	42.2	40.7	38.5	31.7	56.2	38.4	57.0	63.9	48.1
Farlington, Cal.	70.2	71.2	75.5	68.1	45.1	45.4	48.2	52.6	38.4	57.0	63.9	48.1
Fowler, Cal.	(1)	88.4	82.2	62.3	52.3	40.0	48.9	54.6	64.2	78.3	84.4	68.8
Frederic, Cal.	86.8	80.3	59.0	50.2	51.6	46.7	49.5	54.6	59.4	70.9	78.5	63.8
Galt, Cal.	80.1	78.5	60.3	52.2	48.8	47.7	48.8	54.6	60.0	66.7	65.2	62.5
Gilroy, Cal.	72.9	68.5	60.2	47.3	47.3	46.5	48.4	54.0	53.2	64.7	71.1	64.9
Goldsboro, Nev.	78.9	79.6	49.5	37.4	37.4	31.6	30.3	44.1	53.2	70.0	71.1	64.9
Goshute, Cal.	82.9	82.2	63.8	53.3	45.5	47.6	53.1	58.1	59.4	73.1	73.0	63.1
Haleck, Nev.	(1)	68.3	41.2	33.9	23.8	15.7	17.9	38.1	43.8	(1)	58.0	63.1
Hawley, Nev.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	55.9	57.0	(1)	73.9	63.1
Hawthorn, Nev.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	53.1	57.0	(1)	68.4	63.1
Hollister, Cal.	66.0	66.3	57.6	51.6	50.8	48.6	53.3	53.1	54.0	62.9	67.1	54.5
Hotel del Monte, Cal.	63.0	61.1	50.8	51.4	50.8	48.6	53.3	53.1	54.0	62.9	67.1	54.5
Hot Springs, Nev.	74.0	71.2	44.5	45.2	27.3	28.9	28.5	40.5	48.9	65.2	60.7	49.7
Humboldt, Nev.	77.0	73.5	40.3	35.1	27.8	28.2	25.0	40.4	48.8	67.8	67.8	48.9
Indio, Cal.	94.1	86.8	74.6	63.8	60.9	52.3	50.4	61.7	67.9	76.0	82.5	68.7
Ionio, Cal.	78.6	75.7	65.2	55.2	49.6	52.4	53.2	55.9	66.7	68.7	68.7	68.7
Koeber, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	65.6	77.1	82.9	55.3
Koeber, Cal.	73.4	71.9	50.7	45.1	45.1	42.7	41.2	45.1	45.4	60.1	67.2	55.3
Kona, Cal.	77.7	78.4	43.5	34.7	24.8	20.2	23.8	37.1	45.4	58.9	70.8	48.4
Kotton, Utah	88.8	84.0	67.6	61.2	57.9	56.2	53.5	56.4	61.7	71.5	75.8	67.7
Kingburg, Cal.	(1)	(1)	60.5	52.6	47.2	48.4	47.7	54.0	53.0	67.2	70.6	67.7
Knight's Landing, Cal.	91.2	87.1	60.1	53.6	39.8	43.5	47.8	52.4	57.9	63.6	64.8	57.2
Lathrop, Cal.	80.1	64.6	63.7	53.6	44.1	52.1	46.6	51.9	54.1	71.6	72.7	57.2
Lemoore, Cal.	82.9	78.1	58.9	52.4	44.1	48.7	49.2	54.1	54.4	58.8	62.2	57.7
Livermore, Cal.	69.7	68.4	59.7	44.6	51.2	48.0	49.2	54.1	54.4	58.8	62.2	57.7
Loma Prieta, Cal.	(1)	(1)	(1)	(1)	(1)	46.0	41.9	49.9	62.7	60.4	65.7	63.6
Louisburg, N. Mex.	85.8	84.1	64.0	51.3	41.5	33.5	46.1	51.5	62.0	77.1	85.7	63.6
Los Angeles, Cal.	73.2	75.3	68.8	65.5	61.9	59.2	60.1	62.0	63.8	66.3	72.9	66.7
Los Angeles, Cal.	97.6	94.2	74.1	64.9	60.0	54.7	59.0	58.9	68.8	85.0	92.0	69.6
Mannoth Park, Cal.	90.7	92.8	65.5	59.2	53.0	48.0	55.8	59.5	68.1	81.9	89.6	70.7
Maricopa, Ariz.	68.1	64.8	58.8	49.6	44.0	43.8	44.4	54.1	54.8	61.2	63.6	56.2
Martinez, Cal.	80.9	80.0	61.3	50.0	44.6	43.7	48.0	55.8	67.0	68.1	70.8	57.0
Marysville, Cal.	65.4	64.4	65.9	49.8	46.5	46.4	48.1	53.2	57.2	65.6	65.3	62.7
Meelo Park, Cal.	83.2	81.2	61.2	53.7	49.9	47.4	48.9	51.5	59.7	65.4	67.6	62.7
Merced, Cal.	78.9	77.8	60.5	51.1	44.5	40.4	46.4	52.2	54.2	65.4	67.6	61.6
Mojave, Cal.	88.7	87.8	79.8	68.2	59.7	45.8	45.2	52.2	51.8	60.3	60.3	61.6
Mojave, Cal.	65.4	62.5	65.2	57.4	51.9	56.1	50.6	55.9	57.8	60.8	62.5	60.8
Monterey, Cal.	71.6	67.5	57.4	55.8	54.0	48.8	52.0	52.8	51.3	68.2	69.3	60.8
Napa, Cal.	(1)	(1)	70.8	64.8	49.7	51.7	53.8	60.7	68.8	77.8	80.3	68.2
Needham, Ariz.	74.9	76.2	65.2	53.0	51.2	48.4	48.9	51.4	44.0	62.9	63.1	59.2
Niles, Cal.	68.9	65.2	56.9	51.3	46.5	46.6	49.2	53.1	54.3	62.9	63.1	59.2
Oakland, Cal.	60.1	57.3	60.8	62.0	48.6	48.0	49.3	53.4	55.5	68.0	60.3	52.3
Ogden, Utah	81.9	78.3	69.1	46.1	29.1	24.4	28.4	43.4	50.7	64.3	73.3	63.1
Orland, Cal.	87.5	85.3	63.4	54.9	47.5	46.2	50.1	55.4	59.4	73.4	73.3	63.1
Oroqui, Nev.	78.7	78.3	67.5	61.4	25.2	19.6	19.3	23.0	44.9	54.9	64.9	46.5
Pajaro, Cal.	62.0	61.4	61.4	53.2	51.2	48.8	52.9	52.8	47.2	60.3	62.9	56.3
Palmdale, Nev.	77.1	71.3	60.5	50.4	43.4	24.6	20.0	38.2	47.2	63.3	72.9	56.3

Record incomplete.

No record.



Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending June 30, 1894, *ft.*—Continued.

Stations.	1893.						1894.						Annual mean.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Pantano, Ariz.	86.2	80.5	78.1	66.9	61.7	53.8	48.4	51.1	55.0	56.2	66.1	63.0	55.6
Petaluma, Cal.	62.9	62.2	65.7	65.1	63.0	44.2	45.8	47.7	53.0	55.6	63.7	63.0	55.6
Pleasanton, Cal.	71.5	74.7	71.2	62.5	53.0	44.2	44.6	46.0	51.1	57.6	63.7	63.0	55.6
Promontory, Utah.	75.9	78.1	72.5	41.7	30.7	24.3	21.5	22.9	37.6	46.9	58.4	72.5	47.9
Ravenna, Cal.	82.6	82.6	82.6	65.4	50.7	49.8	49.0	45.9	48.5	54.4	63.0	63.0	58.8
Red Bluff, Cal.	87.3	82.6	78.8	62.1	56.1	48.1	45.4	45.2	50.7	56.6	63.0	71.8	62.7
Redding, Cal.	81.7	76.8	77.9	65.3	54.5	48.1	45.4	45.2	50.7	56.6	63.0	63.0	58.8
Reno, Nev.	76.1	71.7	65.9	45.3	37.8	28.9	27.5	25.7	37.1	41.9	54.5	62.8	47.8
Rocklin, Cal.	78.7	74.9	70.7	58.8	50.8	45.7	43.6	47.3	53.0	57.6	63.0	63.0	58.8
Sacramento, Cal.	77.2	73.8	72.9	58.1	50.1	45.0	44.7	47.7	54.3	59.9	63.0	70.4	60.4
Salinas City, Cal.	62.6	61.9	62.0	56.0	50.8	49.4	49.4	49.8	53.9	56.4	63.3	63.3	56.3
San Fernando, Cal.	73.2	74.8	74.8	65.1	61.0	56.9	52.7	53.9	53.6	57.8	63.1	63.1	56.3
San José, Cal.	68.8	66.3	67.1	57.5	50.8	47.3	47.8	48.6	52.6	56.2	62.8	61.6	57.0
San Mateo, Cal.	62.1	60.9	64.3	54.9	49.0	46.1	44.8	45.8	50.3	53.0	59.2	60.8	54.3
San Simon, Ariz.	80.7	83.1	76.4	68.7	60.5	55.0	45.6	45.7	51.7	62.7	73.5	81.8	68.5
Santa Cruz, Cal.	64.7	64.2	65.5	53.7	54.8	54.1	52.5	53.4	55.7	57.7	62.6	63.9	59.0
Soledad, Cal.	67.5	65.6	65.6	50.6	50.5	48.7	45.4	48.7	53.3	58.4	65.8	65.9	58.6
Soquel, Cal.	67.5	62.2	65.6	56.9	57.2	54.0	55.5	50.9	53.5	54.4	63.6	63.9	58.6
Soscol, Cal.	68.7	68.6	68.4	65.8	60.0	55.3	54.4	52.2	56.4	62.3	63.6	66.7	62.6
South Vallego, Cal.	72.4	75.3	75.8	62.2	57.3	57.3	53.2	52.2	56.4	62.0	63.4	70.7	63.8
Spadra, Cal.	72.8	70.6	72.0	56.9	46.9	46.0	44.4	45.9	53.1	57.6	63.1	64.1	57.8
Stockton, Cal.	61.5	75.8	73.0	53.9	41.7	24.0	37.4	45.9	53.1	59.0	63.6	64.1	58.5
Suisun, Cal.	64.9	64.2	62.5	56.0	50.7	29.6	31.2	35.1	29.5	39.7	39.7	44.2	38.4
Summit, Cal.	64.9	64.2	62.5	56.0	50.7	29.6	31.2	35.1	29.5	39.7	39.7	44.2	38.4
Summit, Nev.	68.4	74.8	73.1	62.0	51.7	48.2	45.2	47.8	56.8	59.6	67.7	76.1	64.1
Tecoma, Nev.	68.4	74.8	73.1	62.0	51.7	48.2	45.2	47.8	56.8	59.6	67.7	76.1	64.1
Tehama, Cal.	68.4	74.8	73.1	62.0	51.7	48.2	45.2	47.8	56.8	59.6	67.7	76.1	64.1
Tehachapi, Cal.	68.4	74.8	73.1	62.0	51.7	48.2	45.2	47.8	56.8	59.6	67.7	76.1	64.1
Tennant, Cal.	70.8	72.3	71.9	67.6	63.2	52.4	49.8	50.1	52.7	56.4	64.3	64.3	52.8
Terrace, Utah.	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
Texas, Hill, Ariz.	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
Toano, Nev.	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
Tracy, Cal.	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
Truckee, Cal.	68.1	61.8	61.8	43.5	32.9	29.8	25.6	25.6	30.9	39.7	50.8	50.8	48.8
Tulare, Ariz.	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
Turlock, Cal.	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2

Wadsworth, Nev.....	56.5	51.2	67.3	50.5	42.1	55.5	32.6	44.3	53.7	43.2	63.9	53.9
Walla, Nev.....	73.0	71.1	64.2	41.7	32.6	36.9	13.9	32.4	43.0	52.4	60.3	44.3
Wallo, Wyo., Cal.....	54.9	62.6	53.6	71.6	64.0	53.3	51.9	50.8	40.4	47.3	70.3	43.2
Willie, Wash., Cal.....	54.7	73.5	74.8	60.8	51.7	44.7	49.8	51.3	50.5	47.3	77.9	63.2
Williams, Cal.....	54.0	(1)	77.4	62.1	51.4	43.4	47.3	52.6	53.7	71.3	63.9	63.2
Willow, Cal.....	55.8	51.9	51.0	63.6	55.3	45.4	48.0	53.0	53.2	64.7	73.6	63.2
Willow, Cal.....	53.3	75.3	65.0	59.1	33.0	34.1	20.2	33.0	43.8	63.9	72.3	50.7
Windsor, Nev.....	73.8	75.3	75.5	63.3	54.7	43.0	45.6	54.3	53.1	62.5	60.3	60.7
Woodland, Cal.....	53.5	53.6	53.9	70.5	64.3	53.8	53.9	60.9	67.4	77.9	(1)	60.7
Yuma, Ariz.....												

No record.

Record incomplete.

## APPENDIX 46.

Maximum and minimum temperatures and annual range of temperature (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, for the year ending June 30, 1884.

[Obtained from ordinary thermometers—highest and lowest observed. Copied from the records on file at the office of the chief engineer, Central Pacific Railroad, by the observer at San Francisco, Cal.]

Stations.	1883.												1884.												Annual range.	
	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.			
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
Alta, Cal.	96	64	90	62	98	52	68	38	70	30	70	20	60	30	70	16	60	28	68	30	80	46	88	44	82	71
Anaheim, Cal.	94	66	102	62	107	60	86	44	86	44	82	48	72	42	80	40	90	36	80	50	92	54	98	54	88	71
Antioch, Cal.	104	58	108	58	102	58	80	38	68	28	62	26	60	26	64	22	72	34	72	38	84	50	88	52	83	80
Auburn, Cal.	100	61	98	54	95	52	79	42	72	32	69	29	65	31	73	20	70	33	72	34	84	50	88	50	80	130
Battle Mountain, Nev.	100	66	100	58	100	58	80	40	68	21	62	16	50	8	53	30	65	24	72	30	85	42	90	50	130	130
Benson, Ariz.	103	72	98	73	98	66	87	50	79	35	74	30	67	20	78	30	78	38	84	48	91	54	(1)	(1)	121	121
Beowawe, Nev.	98	63	98	58	92	41	63	26	64	15	46	20	42	19	50	23	54	22	58	35	90	45	85	45	85	85
Bishop's Creek, Nev.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	68	15	(1)	(1)	(1)	(1)	63	32	55	20	84	33	85	42	118	118
Blue Creek, Utah	103	66	102	58	93	50	70	30	68	20	48	8	48	7	40	15	54	25	65	40	104	45	102	45	88	88
Boca, Cal.	80	35	88	30	85	26	64	12	68	5	65	Zero	50	14	45	39	45	2	34	84	104	45	102	45	88	88
Borden, Cal.	114	60	114	61	100	55	98	40	110	30	86	26	80	26	87	28	101	34	94	40	104	45	102	45	88	88
Brentwood, Cal.	108	64	108	58	98	63	77	46	78	29	61	24	41	28	67	22	76	35	71	42	84	49	90	53	80	80
Brighton, Cal.	105	61	104	58	104	55	84	46	79	30	67	25	41	30	74	25	80	41	80	47	92	55	95	53	80	80
Brown, Nev.	101	70	99	62	92	54	78	37	66	19	62	11	51	10	58	16	62	28	74	34	85	52	96	54	117	117
Byron, Cal.	111	60	100	56	102	66	80	46	74	30	64	26	62	30	74	28	76	40	76	42	90	50	94	56	88	88
Calliente, Cal.	100	62	102	70	98	62	75	42	72	32	(1)	(1)	70	31	70	28	74	32	74	42	90	50	94	56	88	88
Calliope, Cal.	105	55	102	48	104	49	87	34	78	20	64	23	(1)	20	56	17	75	31	75	40	90	51	92	55	88	88
Camp Wright, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	77	37	(1)	(1)	65	35	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	134	134
Carlin, Nev.	100	60	92	50	90	36	60	14	60	2	44	30	44	22	44	34	54	20	66	30	80	34	90	44	85	85
Casa Grande, Ariz.	106	83	105	80	108	73	99	54	86	44	70	39	70	32	73	28	75	45	66	52	102	58	113	68	90	90
Cileco, Cal.	110	74	108	70	107	62	86	40	75	30	63	30	60	30	78	20	76	34	85	48	98	56	97	54	80	80
Chualar, Cal.	86	40	84	44	84	42	75	40	80	30	75	32	70	26	85	31	70	37	80	40	98	40	98	40	77	77
Cisco, Cal.	86	54	84	48	84	42	64	26	64	30	62	32	44	16	44	16	44	16	42	25	53	32	70	35	66	66
Colfax, Cal.	105	67	101	58	100	50	84	40	74	34	77	32	62	34	75	23	68	38	72	36	88	40	90	46	88	88
Colton, Cal.	104	50	106	48	104	48	85	39	80	40	74	31	61	30	80	30	74	44	76	43	84	39	84	39	130	130
Cortina, Utah	106	70	106	65	101	55	84	40	80	33	61	Zero	40	20	53	15	57	24	76	84	84	84	84	84	130	130
Cortina, Ariz.	(1)	(1)	108	73	101	64	85	53	80	30	72	32	62	27	80	24	70	33	80	88	96	49	99	53	80	80
Dayton, Cal.	112	68	108	56	106	64	92	44	81	30	72	32	62	27	80	24	70	33	80	88	96	49	99	53	80	80
Dayton, Nev.	108	68	108	56	106	64	92	44	81	30	72	32	62	27	80	24	70	33	80	88	96	49	99	53	80	80
Dayton, M. Mex.	107	70	108	56	106	64	92	44	81	30	72	32	62	27	80	24	70	33	80	88	96	49	99	53	80	80

[illegible]

**Record incomplete.**

**No record.**

Maximum and minimum temperatures and annual range of temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, for the year ending June 30, 1884—Continued.

Stations.	1883.						1884.						Annual range.	
	July.		August.		September.		October.		November.		December.			
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
Pantano, Ariz.	104	70	103	68	103	61	93	45	98	40	80	32	68	76
Petaluma, Cal.	82	54	90	48	98	43	84	27	72	27	64	22	73	73
Pleasanton, Cal.	84	54	95	35	95	35	87	45	72	24	64	22	73	73
Promontory, Utah	104	56	104	57	94	43	83	21	52	Zero.	50	10	136	136
Raynes, Cal.	103	68	104	50	104	45	84	45	86	46	86	26	84	84
Red Bluff, Cal.	110	68	104	62	110	63	86	46	86	36	72	22	88	88
Redding, Cal.	106	64	101	55	103	50	82	50	73	33	(1)	(1)	113	113
Stockton, Cal.	108	60	102	51	108	45	87	43	81	19	50	14	57	57
Teno, Nev.	104	60	101	55	108	45	87	43	81	19	50	14	57	57
Rocklin, Cal.	95	63	98	60	99	57	88	42	88	32	67	29	52	52
Sacramento, Cal.	76	54	72	56	105	52	86	42	82	64	30	63	28	28
Salinas City, Cal.	96	50	100	56	104	52	83	41	81	32	64	40	78	78
San Fernando, Cal.	92	54	92	51	96	52	81	41	71	30	63	29	70	70
San Jose, Cal.	91	52	90	50	96	50	78	38	68	31	62	30	59	59
San Marcos, Cal.	108	65	103	64	100	54	88	40	85	30	80	28	69	69
San Simon, Ariz.	82	51	88	51	98	48	83	41	78	26	77	39	68	68
Santa Cruz, Cal.	102	52	102	52	108	52	88	36	74	24	76	30	66	66
Sedalia, Cal.	(1)	(1)	82	52	(1)	(1)	96	44	84	32	80	32	78	78
Soquel, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	96	44	84	32	80	32	78	78
Stockton, Cal.	90	57	86	51	98	61	79	41	77	40	78	32	75	75
South Valley, Cal.	96	58	103	53	106	57	84	48	84	40	80	36	68	68
Spadra, Cal.	100	56	98	50	90	54	76	40	64	30	64	30	56	56
Stockton, Cal.	104	60	98	60	98	60	87	30	62	19	56	18	63	63
Stutsen, Cal.	74	40	75	43	73	32	46	23	42	8	6	6	6	6
Sunnyside, Cal.	113	60	108	63	109	58	82	33	73	30	70	25	78	78
Tamara, Nev.	103	58	94	46	92	38	62	18	52	9	57	15	53	53
Tehama, Cal.	104	64	104	64	105	58	70	38	66	28	66	26	54	54
Tehachap, Cal.	100	50	98	42	94	46	76	26	68	27	61	26	54	54
Tennant, Cal.	102	51	102	52	101	44	86	35	80	27	60	28	50	50
Texas Hill, Ariz.	104	50	(1)	86	(1)	86	44	73	28	57	12	47	5	5
Tono, Nev.	115	60	119	62	118	60	86	43	77	20	74	23	50	50
Tony, Cal.	94	66	96	65	90	50	80	41	74	26	64	24	56	56
Treasure, Cal.	108	49	107	41	107	39	80	36	80	27	61	26	54	54
Tulare, Cal.	110	50	110	42	108	40	80	36	80	27	61	26	54	54

Turlock, Cal .....	110	62	113	64	109	62	96	36	82	24	81	24	72	25	79	22	83	32	94	42	95	56	94	83	91
Wadsworth, Nev .....	103	72	98	52	92	40	70	36	68	16	50	14	56	8	60	10	61	28	94	40	84	56	94	80	112
Wells, Nev .....	96	48	91	46	90	44	60	26	52	2	48	28	46	12	42	22	50	12	62	22	78	32	82	84	124
White Water, Cal .....	114	81	113	80	115	61	104	45	91	38	84	36	72	39	85	31	70	39	84	47	102	50	107	54	84
Willcox, Ariz .....	103	65	97	65	95	50	83	34	81	24	77	16	72	10	85	22	80	27	81	80	92	44	104	58	94
Williams, Cal .....	114	60	( <sup>1</sup> )	( <sup>1</sup> )	105	59	78	46	73	28	62	23	64	33	80	26	78	34	76	48	96	58	92	56	...
Willows, Cal .....	113	68	103	62	108	61	85	49	72	37	69	33	62	32	67	32	81	35	79	36	90	40	107	43	80
Winnemucca, Nev .....	101	72	96	60	87	49	75	42	56	12	55	10	50	5	48	27	65	22	78	30	97	14	99	50	128
Woodland, Cal .....	106	60	103	50	102	58	86	50	70	34	65	29	66	30	72	29	69	30	74	46	85	56	94	58	77
Yuma, Ariz .....	105	86	107	85	105	09	94	50	86	46	76	45	69	44	82	37	81	43	95	45	98	09	( <sup>1</sup> )	( <sup>1</sup> )	...

<sup>1</sup> No record.<sup>2</sup> Record incomplete.

## APPENDIX 47.

Table showing the mean of the maximum and minimum temperatures (in degrees Fahrenheit) at the special cotton-region stations of the Signal Service, United States Army, for the months July to October, 1883, and April to June, 1884, both inclusive.

[These means are obtained by dividing the sum of the readings of the self-registering thermometers by the number of observations taken—one daily, at 5 p. m.]

Stations.	1883.								1884.					
	July.		August.		September.		October.		April.		May.		June.	
	Mean.		Mean.		Mean.		Mean.		Mean.		Mean.		Mean.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Wilmington, N. C.:	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Cheraw, S. C.	92.2	68.7	91.2	66.5	82.5	58.9	75	54	71.0	44.7	72.4	56.4	87.7	61.6
Florence, S. C.	94.8	70.2	94.9	68.4	83.5	62.7	78.3	54.3	72.5	48.3	72.3	61.1	84.5	63.6
Goldsbrough, N. C.	91.8	71.5	87.4	68.1	80.1	63.1	72.8	55.8	70.1	49.0	71.7	60.7	84.1	64.3
Lumberton, N. C.	94.8	70.1	98.7	67.2	81.4	61.3	74.3	55.6	71.7	46.6	75.6	59.7	85.3	62.8
New Bern, N. C.									70.4	44.7	73.7	52.1	86.1	62.8
Raleigh, N. C.									71.7	44.7	72.5	52.9	84.5	61.7
Salisbury, N. C.	92.4	68.5	92	61.6	81.2	58.7	( )	( )	68.5	38.5	82.9	61.9	85.4	57.6
Wadesborough, N. C.	93	71	86.1	67	82.4	58.1	( )	( )	71.1	47.1	82.4	60.0	84.3	62.4
Weldon, N. C.	91.6	68.4	87.2	65.4	79	61.6	( )	( )	66.1	44.0	80.6	57.1	84.4	61.7
Charleston, S. C.:														
Branchville, S. C.	91.1	72.3	88.5	64.9	82.3	64.3	76.8	57.8	70.3	50.5	76.4	63.3	84.5	63.0
Hardenville, S. C.	95.8	70.4	91.5	68.5	86.5	62.2	80.5	58.6	76.3	51.0	82.0	61.7	83.8	64.4
Jacksonborough, S. C.	94.7	70.0	89.3	71.3	84	64	73.4	62.7	73.6	55.7	75.6	61.6	86.1	67.7
Kingstree, S. C.	94.8	68	90.6	68.6	83.3	56	73.6	51.7	72.5	46.5	77.2	59.7	87.1	62.8
Saint George's, S. C.	96	70	91	68	84.4	62.3	78.4	58.6	74.5	48.3	87.0	60.1	85.7	62.5
Saint Matthew's, S. C.	96	72	90.7	69.8	84	56	76	48	75.1	49.7	85.8	62.8	84.5	62.9
Yemassee, S. C.	94.4	75.8	90.5	68.8	84.5	60.3	79.4	59	74.8	50.2	86.9	63.8	83.9	63.3
Augusta, Ga.:														
Allendale, S. C.	97	78	91.5	73.2	84.6	73.2	78.8	55	69.4	48.6	86.4	54.1	84.8	53.7
Athens, Ga.	100	72.7	93.4	67.6	86.9	61.2	77.5	57.2	72.4	47.5	88.3	60.3	83.2	63.0
Batesburg, S. C.									( )	( )	( )	( )	85.2	63.3
Blackville, S. C.									( )	( )	( )	( )	85.3	63.6
Camak, Ga.									( )	( )	( )	( )	86.0	63.1
Chester, S. C.	92.9	69.5	92	66.4	( )	( )	74	57	70.5	46.7	83.7	60.5	84.5	63.3
Columbia, S. C.	92	72	89	69	81	62	74.4	54.5	71.6	48.0	83.9	61.9	84.1	64.5
Covington, Ga.	98.7	88	92	71	85.8	68.1	80.9	55.5						
Greenwood, S. C.									( )	( )	( )	( )	81.6	62.1
Union Point, Ga.	93.1	69.2	88.1	66.5	83	60.2	76.1	55.6	70.4	44.7	82.8	53.8	( )	( )
Washington, Ga.									( )	( )	80.1	61.2	86.9	62.6
Waynesborough, Ga.									( )	( )	( )	( )	83.3	63.3
Savannah, Ga.:														
Albany, Ga.	96.7	73.7	93.1	72.1	87.5	65.9	85.1	61.8	76.5	53.1	88.9	65.9	85.1	67.8
Allapaha, Ga.	96.9	75.8	95.5	68.3	87	61.8	84	54.3	77.8	52.6	84.1	62.7	85.6	61.9
Bainbridge, Ga.	94.4	72.9	92.7	69.1	87.3	72.8	85.8	70.5	78.2	60.4	87.1	69.3	83.8	67.4
Eastman, Ga.	99.6	73.4	95.7	75.6	87.4	66	( )	( )	73.5	( )	87.8	71.0	85.6	58.2
Fernandina, Fla.	98.8	74.8	95.8	72.8	88.0	69.2	79.9	70	77.0	57.5	84.2	64.1	83.6	65.4
Fort Gaines, Ga.	96.2	70.7	92.2	69.4	86.8	62.3	83.8	58.7	77.0	58.0	86.9	63.1	85.8	65.4
Jesup, Ga.	100.3	72.9	91	69.3	82.6	64.2	81.7	58.4	77.7	52.0	89.1	62.4	86.6	64.8
Live Oak, Fla.	92.4	70.3	91.4	68.7	89.6	62.4	86.8	60.4	81.9	51.3	90.7	61.0	89.7	63.4
Millen, Ga.	98	70.5	93	68	86.7	61.3	81	58.1	76.2	49.1	88.9	61.1	86.1	63.7
Quitman, Ga.	97.2	71.9	93.7	70.2	88.8	64.6	85.5	61.5	79.6	54.2	90.2	64.3	86.0	65.5
Smithville, Ga.	98.2	73.3	94.8	73.2	88	62.2	85.2	58.4	77.1	50.0	89.6	61.2	84.6	63.4
Thomasville, Ga.	94.6	72.5	91.3	71.9	86.6	65.4	85.8	64.4	77.4	54.6	86.3	61.8	83.4	67.3
Waldo, Fla.	92.9	72	92	70.5	87.9	66.6	83.7	64.8	83.2	58.0	92.8	64.0	87.7	64.8
Way Cross, Ga.	100.4	68.8	95.1	68.9	92.6	64.8	78.9	65.2	75.1	61.3	91.9	76.3	90.3	65.3
Vicksburg, Miss.:														
Edwards, Miss.	93.7	73.7	92.5	73.9	89	60.4	81.3	61.8	73.6	52.8	81.5	62.8	89.0	68.5
Jackson, Miss.	94.5	73.6	92.6	68.4	90.3	59.9	82.7	64.9	76.1	52.8	83.3	61.8	89.6	68.6
Lake, Miss.	89.7	68.1	92.9	66.4	89.1	57.6	80.5	56.3	75.8	50.3	82.3	59.6	86.8	64.8
Monroe, La.	92.6	72.7	92.2	69.4	87.9	60.7	80.7	61	74.5	54.3	81.0	62.8	84.9	68.0
Atlanta, Ga.:														
Anderson, S. C.									( )	( )	( )	( )	83.9	54.2
Calhoun, Ga.	92.9	67.1	87.9	64.9	84.1	59.1	73.2	56.1						
Carterville, Ga.	95	67	95.6	66.6	84.8	60.6	77.2	57.2	68.4	44.2	83.3	57.7	84.5	63.2
Columbus, Ga.	92	73	91	66	85	65	78	61	73.5	51.8	85.0	64.4	83.1	66.3
Dalton, Ga.	93	75	88	68	85	61	75.6	56.7	69.5	46.4	82.6	58.3	84.0	63.4
Gainesville, Ga.	92.3	67.7	88.9	66.3	80	61	76	60	68.4	51.0	78.9	64.0	78.2	63.1
Greenville, S. C.									70.1	44.3	85.1	57.1	81.6	61.2

\*19 days only. \*16 days only. \*No record. \*Record incomplete. \*Station closed. \*17 days only.

Mean of the maximum and minimum temperatures, &amp;c.—Continued.

Stations.	1883.								1884.							
	July.		August.		Septem-ber.		October.		April.		May.		June.			
	Mean.		Mean.		Mean.		Mean.		Mean.		Mean.		Mean.			
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Atlanta, Ga.:	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Griffin, Ga.	92.4	71.5	87	68.4	82.4	63.1	78	58.4	70.9	49.5	82.9	62.6	80.2	64.6		
Macon, Ga.	93.7	73	90	69.9	85.4	62.8	81.1	58.9	75.0	50.6	87.4	62.5	85.0	65.3		
Madison, Ga.	96	67	91	60	88	52	83	49	70.1	41.6	( <sup>1</sup> )					
Newnan, Ga.	103.7	79.8	88.2	70.5	82.2	65.5	75.2	53.3	71.4	50.3	84.7	61.3	82.8	62.7		
Spartanburg, S. C.	94	68	90	65	82	59	74	53	73.7	45.2	84.8	57.1	82.5	58.4		
Toccoa, Ga.	96.4	67.3	90.2	64.9	82.8	59.6	74.3	54.3	69.9	46.4	85.2	57.2	82.3	61.2		
West Point, Ga.	93.3	70.4	91.6	68.1	85.7	61.4	82.8	58	73.2	50.3	86.2	61.2	83.6	65.5		
Montgomery, Ala.:																
Birmingham, Ala.	95.2	69.4	91.7	67.7	( <sup>2</sup> )	( <sup>2</sup> )	79.2	56.9	72.2	47.0	84.3	53.1	84.3	61.4		
Calera, Ala.	100.2	65.9	95.3	65.1	90.2	57.6	78.8	48.6	76.5	47.5	86.8	57.7	87.2	61.5		
Demopolis, Ala.	95	70.1	94.2	69.3	91.8	62.9	83.4	63	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>1</sup> )					
Eufaula, Ala.									( <sup>2</sup> )	( <sup>2</sup> )	48.5	44.4	85.3	66.8		
Fort Deposit, Ala.									( <sup>2</sup> )	( <sup>2</sup> )	48.5	46.5	83.1	65.7		
Greenville, Ala.	93.9	70.7	91.9	69.7	82	58.3	86.9	60.6	75.9	53.4	85.7	60.9	86.7	65.0		
Marion, Ala.									( <sup>2</sup> )	( <sup>2</sup> )	89.2	62.0	87.8	66.1		
Opelika, Ala.	96.8	70.3	91.5	72	85.1	63	80	58.4	73.6	50.0	86.5	60.7	83.3	63.1		
Pine Apple, Ala.	97.7	66.4	93.8	67.3	90.3	62.8	85.1	67.2	77.5	51.7	86.2	60.5	86.2	65.7		
Selma, Ala.	94.1	70.6	91.4	70.2	88.4	68.2	82.5	60.1	74.3	44.1	83.5	51.7	83.5	56.6		
Talladega, Ala.	93.8	68	90.3	67.1	90.7	58.5	87.7	64.6	( <sup>2</sup> )	( <sup>1</sup> )						
Tuscaloosa, Ala.	96	67.5	92.1	62.6	83.5	52.4	81.2	54.8								
Uniontown, Ala.	88.4	71.8	92.4	71	89.2	64.6	82.0	62.7	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>1</sup> )					
Mobile, Ala.:																
Aberdeen, Miss.	93.2	68.8	89.7	67	87	59.2	76.3	55.8	68.3	50.4	80.9	59.7	81.6	65.5		
Columbus, Miss.	98.8	70.3	94.4	68.9	89.9	60.8	81.3	59.3	75.5	50.7	86.3	60.3	88.6	66.5		
Evergreen, Ala.									80.3	53.3	89.5	60.6	88.8	63.9		
Livingston, Ala.									76.5	51.8	86.8	61.9	89.2	66.8		
Macon, Miss.	102.3	70.9	92.7	68.7	92.3	61.7	83	58.8	75.4	51.2	85.1	61.6	89.7	68.5		
Meridian, Miss.	98.3	69.8	95.1	67.2	90.6	65.7	83.7	58.8	76.8	51.5	86.3	61.5	88.7	66.4		
Okalona, Miss.	97.8	70.8	93.1	67	91.8	59.3	80.2	55.8	74.1	47.3	84.8	59.2	89.3	64.2		
State Line, Miss.	99.1	71.9	97	69.9	92.9	63.8	86.7	63.3								
Waynesborough, Miss.	99.4	70	( <sup>2</sup> )	( <sup>2</sup> )	96	57	( <sup>2</sup> )	( <sup>2</sup> )	77.8	52.4	85.0	61.2	87.4	66.7		
New Orleans, La.:																
Alexandria, La.	95.3	73.2	94.3	68	88.5	61	80.3	44	( <sup>2</sup> )	( <sup>2</sup> )	87.6	54.6	92.4	59.2		
Amite City, La.	96	70	96.3	69	( <sup>2</sup> )	( <sup>2</sup> )	90.8	63.2	75.4	45.0	80.3	60.0	89.2	68.5		
Brookhaven, Miss.	94.5	70.8	91.3	68.8	87.3	61.1	81.5	60.5	75.5	53.2	84.1	62.6	89.7	67.0		
Cheneyville, La.	94.5	71.2	93	67.9	88	59	86.3	60.4	77.3	56.5	84.8	62.7	89.7	67.2		
Coushatta Chute, La.	93.4	71.7	97.6	68.5	88.4	61	81.6	61.8	74.0	52.7	82.4	62.7	91.7	68.3		
Franklin, La.	95	72	96	71	92	65	89	64								
Hazlehurst, Miss.									81.8	53.0	86.2	69.0	91.7	74.0		
Lafayette, La.	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	77.1	57.0	85.5	64.6	88.7	69.1		
Minden, La.									80.8	62.1	83.5	61.6	92.6	63.0		
Morgan City, La.	95	55	93.9	50.9	89.8	68.3	82.5	69								
Natchez, Miss.									77.9	55.9	81.3	63.2	86.6	68.4		
Natchitoches, La.	88.1	73.2	93.1	62.5	84.7	60.6	83.3	60.3	71.0	54.8	76.7	63.1	88.0	69.7		
New Iberia, La.	97.8	86	98.4	86	92.7	78.2	( <sup>1</sup> )	( <sup>1</sup> )								
Opelousas, La.									72.2	( <sup>2</sup> )	78.5	( <sup>2</sup> )	88.7	68.6		
Pass Christian, Miss.	94	82	97	85.9	88.3	82.4	85.1	79.9								
Scranton, Miss.	92.8	76.2	92	72.1	88	66	86	65.2								
Terre Bonne, La.	92.5	74.6	92.3	72	88.3	66	80.3	64.9								
Whiteville, La.	92	72	95	70	87	60	83	63	76.2	56.0	83.6	68.9	87.7	67.6		
Galveston, Tex.:																
Austin, Tex.	94	73.9	99.8	73.2	91	66	( <sup>2</sup> )	( <sup>2</sup> )	77.1	55.1	( <sup>2</sup> )	( <sup>2</sup> )	92.2	68.9		
Beaumont, Tex.	93	72	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	77.1	46.9	85.2	40.3	91.8	47.8		
Belton, Tex.	94.1	73.6	98.1	71.6	89.6	64.1	( <sup>2</sup> )	( <sup>2</sup> )	74.4	36.2	83.1	37.2	90.5	( <sup>2</sup> )		
Columbia, Tex.									( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	87.7	71.2		
Corpus Christi, Tex.	98.3	73.4	96.6	69.7	92.3	62	85.8	61.7	75.2	52.1	83.9	61.0	92.2	68.6		
Cuero, Tex.	97	74	101	74	89.8	68.9	86	68	78.7	57.6	88.1	65.9	93.0	70.4		
Dallas, Tex.	97	73	97	73	83	62	81	60	75.5	49.3	85.4	60.8	92.3	68.3		
Hearne, Tex.	94	71.1	97.5	73	89.3	65.1	82.6	68.3	75.1	45.6	84.7	54.8	90.2	64.1		
Hempstead, Tex.	97.8	75.5	98	83.1	89.7	73.8	( <sup>2</sup> )	( <sup>2</sup> )	65.8	( <sup>2</sup> )	70.7	( <sup>2</sup> )	75.6	( <sup>2</sup> )		
Houston, Tex.	95.4	72.7	98	70.5	90.8	66.3	85.3	63.5	77.7	56.9	86.6	64.0	92.5	69.3		
Huntsville, Tex.	95	73.5	96.6	71.8	89.9	64.9	83.2	64.9	76.4	53.3	83.6	63.1	90.3	68.6		
Longview, Tex.	97.6	69.6	98.3	61.7	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	74.6	46.6	82.5	50.6	92.3	62.5		
Luling, Tex.	96.1	74.7	101.5	75.8	94.5	70.0	89.5	69.8	479.7	458.5	84.5	64.6	92.3	70.7		
Orange, Tex.	91	63.5	92.1	62.9	84.5	62.7	87	63.3	471.4	449.1	82.8	59.6	( <sup>2</sup> )	( <sup>2</sup> )		
San Antonio, Tex.	( <sup>2</sup> )	( <sup>2</sup> )	98.1	73.9	87.8	67.4	82.9	67.2	( <sup>2</sup> )	( <sup>2</sup> )	80.2	63.8	86.2	70.4		
Sour Lake, Tex.	94.6	71.5	94.1	69	89.5	63.1	85.5	62.8	778.4	754.8	85.4	64.0	91.2	67.2		
Tyler, Tex.	95	67	95	70	87	61	82.6	60	75.4	50.7	82.3	60.4	90.8	66.6		
Waco, Tex.	102.5	73	103	73	88	65	79	65	73.2	53.5	84.3	63.4	92.6	70.5		

Station closed.

No record.

Record incomplete.

20 days only.

10 days only.

16 days only.

18 days only.



Table showing the mean of the maximum and minimum temperatures, &amp;c.—Continued.

Stations.	1883.								1884.					
	July.		August.		Septem-ber.		October.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Galveston, Tex.—Cont'd.	o	o	o	o	( <sup>1</sup> )	o	o	o	o	o	o	o	o	o
Weatherford, Tex.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	77.4	57.1	74.3	66.1	79.2	54.9	87.4	62.3
Weimar, Tex.	96	75.5	98.7	73	89.6	65.8	84.5	62.6	76.1	58.4	85.9	63.1	92.1	72.5
Little Rock, Ark.:														
Arkansas City, Ark.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	262.8	250.9	( <sup>2</sup> )	( <sup>2</sup> )	88.6	63.1
Brinkley, Ark.	94.5	58.6	90.6	52.3	76.6	41.7	74.6	44	67.5	55.2	73.7	62.1	88.9	61.1
Devall's Bluff, Ark.	90.6	70.9	87	56.9	80.5	52.3	74	57	89.4	48.8	76.7	56.7	84.6	64.4
Helena, Ark.									( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	84.9	63.9
Kensett, Ark.	90.7	67.2	90.5	62.8	83.9	52.8	75.5	53.1	67.7	45.0	72.2	54.9	85.8	64.5
Madison, Ark.	82.1	59.7	95	57.1	90	45.4	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	90.4	64.7
Magnolia, Ark.									( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	86.4	63.1
Malvern, Ark.	96.8	69.5	90.7	62.3	88.2	51.8	77	57	73.9	46.4	81.5	67.7	89.4	64.3
Monticello, Ark.	92.7	68.7	89.8	( <sup>2</sup> )	86.4	54.7	72.3	51.8	72.0	45.8	80.4	54.8	87.1	62.3
Newport, Ark.									77.5	48.0	80.1	57.5	86.9	57.1
Paris, Tex.	96.6	64.9	92.8	66.2	88.3	65.5	( <sup>1</sup> )	( <sup>1</sup> )	71.5	47.3	80.4	58.2	88.0	66.1
Pine Bluff, Ark.									( <sup>1</sup> )	( <sup>1</sup> )	77.9	63.6	86.3	74.4
Prescott, Ark.	496.1	467.8	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	73.4	50.4	77.5	62.1	( <sup>2</sup> )	( <sup>2</sup> )
Russellville, Ark.	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	86.5	53.3	86.1	62.4
Texarkana, Ark.	93.2	69.2	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	74.5	49.4	80.3	48.2	88.5	61.5
Walnut Ridge, Ark.	95.3	68.3	87.3	62.7	83.5	51	( <sup>2</sup> )	( <sup>2</sup> )						
Memphis, Tenn.:														
Batesville, Miss.	95.3	70	92.5	66.5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	73.4	50.1	83.2	54.5	87.9	67.4
Bolivar, Tenn.									( <sup>1</sup> )	( <sup>1</sup> )	77.3	57.4	83.4	65.2
Brownsville, Tenn.	90.8	69	87.6	64.9	84.8	56.3	74.2	57	69.6	49.1	78.9	58.1	86.5	64.7
Clarksville, Tenn.	89.8	63.9	86.4	64.9	83.4	57.6	73.4	55.4					83.7	63.1
Corinth, Miss.	91	71	88	68	84	59	76	61	69.7	51.0	81.5	59.5	85.5	64.3
Covington, Tenn.									70.0	48.3	80.7	56.7	85.5	64.3
Decatur, Ala.									71.6	47.6	84.2	58.0	86.8	64.7
Dyersburg, Tenn.	97.1	67.7	89.4	65.6	86.2	58.5	75.9	57.4	69.2	47.1	86.8	54.3	86.3	64.6
Erin, Tenn.	92.1	63.9	89.7	59.6	93.4	47	82.3	44.5					84.0	64.5
Grand Junction, Tenn.	92	69	87	61.0	83.4	56	72	55	69.4	48.5	78.7	57.1	( <sup>1</sup> )	( <sup>1</sup> )
Grenada, Miss.	94	63.3	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	71.6	48.6	81.6	58.4	( <sup>1</sup> )	( <sup>1</sup> )
Hernando, Miss.	97.1	58.5	92	56.8	88	54.3	80	51.4	71.2	50.2	83.0	57.8	86.4	66.0
Holly Springs, Miss.									( <sup>1</sup> )	( <sup>1</sup> )	78.2	63.3	82.6	66.1
Milan, Tenn.	91.4	67.5	86.7	62.0	83.9	63.1	73.3	55.9	69.7	46.7	81.1	56.6	85.8	64.4
Oxford, Miss.									( <sup>1</sup> )	( <sup>1</sup> )	78.8	57.2	83.8	64.6
Paris, Tenn.	90.1	66	95.6	63.5	83.2	64.8	72	54.1	68.1	53.6	73.1	55.3	83.7	64.9
Scottsborough, Ala.	92	66	88	62	77.4	67	75	54	68.7	44.7	81.7	56.5	82.2	62.6
Tusculum, Ala.	90.8	65.4	87.5	64.6	89.1	53.1	81.5	57.6	71.4	49.5	80.6	57.1	83.6	63.1
Withe, Tenn.	92	71	91	65	85.7	64.6	74	58	65.7	59.6	76.8	66.5	80.6	76.8

<sup>1</sup> No record.<sup>2</sup> 18 days only.<sup>3</sup> Record incomplete.<sup>4</sup> 17 days only.<sup>5</sup> Station closed.

# APPENDIX 48.

Monthly and annual amount of precipitation, at stations of the Signal Service, United States Army, for the year ending June 30, 1884.

Stations.	1883.						1884.						Annual amount. Inches.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Albany, N. Y.	5.96	3.69	3.19	3.49	1.14	2.55	2.96	2.85	4.00	2.09	2.79	1.80	37.53
Alexander, Fort, Alaska													
Alpena, Mich.	5.85	1.36	2.45	3.38	3.46	3.20	3.07	2.78	1.61	0.75	3.27	2.67	32.85
Apache, Fort, Ariz.	5.46	4.26	0.60	( <sup>1</sup> ) 0.20	0.39	3.48	0.68	3.43	4.44	1.67	1.31	2.35	29.09
Apache Pass, Ariz.						1.12	3.14	4.96	3.14	0.00	0.23	0.12	
Ashland, Oreg.								2.95	3.14	1.33	0.76	0.24	
Assinaboine, Fort, Mont.	0.24	2.59	0.65	0.96	3.76	0.23	0.16	0.44	0.58	0.25	3.05	4.72	17.60
Astoria, Oreg.						15.78	6.75	7.13	2.56	4.59	1.36	2.04	
Atka, Alaska	3.88	4.83	9.71	10.05	14.72	8.85	8.03	10.31	7.14	5.97			
Atlanta, Ga.	1.06	2.73	1.38	1.52	4.72	4.84	5.20	5.84	9.70	5.86	1.33	10.73	54.91
Atlantic City, N. J.	2.83	3.21	5.31	6.18	1.25	2.54	7.17	7.44	5.79	4.29	1.62	3.00	51.23
Augusta, Ga.	2.21	2.16	1.25	1.69	3.73	2.59	4.34	3.98	6.97	3.68	3.21	4.34	40.15
Baltimore, Md.	3.10	2.72	3.49	2.83	1.37	2.98	4.81	6.69	6.37	2.65	3.17	2.51	42.69
Barnegat City, N. J.	2.43	2.13	4.84	6.61	1.06	2.83	5.25	1.11	2.38	0.97	0.79	2.24	32.54
Behring's Island, Behring Sea	2.09	3.43	3.67	2.52	2.16	1.72	0.94	1.49	1.44	1.38	1.31	0.26	22.41
Bennett, Fort, Dak.	1.79	1.88	0.30	1.19	( <sup>1</sup> )	1.18	0.31	0.57	1.08	2.35	2.69	3.10	16.44
Benton, Fort, Mont.	0.16	1.01	0.83	1.04	0.36	0.11	0.56	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.09	2.18	
Bidwell, Fort, Cal.							2.70	2.70	6.57	2.83	1.40	4.20	18.05
Bismarck, Dak.	1.32	0.98	0.04	3.88	0.26	1.33	0.38	0.87	0.60	2.56	0.60	3.63	18.05
Block Island, R. I.	3.53	1.74	2.60	7.38	3.16	2.85	6.43	7.31	6.40	4.10	6.39	2.59	54.48
Boise City, Idaho		( <sup>1</sup> )	0.20	4.06	0.46	2.27	1.75	1.32	2.78	0.78	0.92	3.41	
Boston, Mass.	2.73	0.39	1.50	6.40	2.08	3.71	6.27	5.74	4.07	4.76	3.81	4.01	45.76
Brownsville, Tex.	4.02	1.97	7.74	1.65	3.32	2.59	1.10	4.03	0.07	0.57	5.96	2.74	31.63
Buffalo, N. Y.	3.35	2.30	2.11	3.58	2.93	2.74	3.36	4.02	2.84	1.56	3.92	2.80	35.52
Buford, Fort, Dak.	1.69	1.96	0.22	1.41	0.14	0.11	0.11	0.11	0.10	1.30	0.14	0.09	8.20
Carlo, Ill.	7.95	1.73	( <sup>1</sup> ) 3.15	6.97	8.34	2.18	2.32	5.58	4.20	3.65	4.37	2.95	46.80
Canby, Fort, Wash. T.						5.87	6.45	5.20	2.18	2.98	1.30	2.16	
Cantonment, Ind. T.						( <sup>1</sup> )	( <sup>1</sup> )	0.73	0.96	2.56	6.95	2.96	50.31
Cape Henry, Va.	5.24	3.48	5.39	7.86	0.74	2.02	8.43	3.31	7.65	2.89	0.78	2.82	47.79
Cape May, N. J.	2.39	3.03	1.40	8.63	3.39	3.81	5.56	6.22	5.61	2.34	1.19	1.03	
Cape Mendocino, Cal.	0.00	0.00	1.40	2.12	1.36	2.25	1.27	1.95	3.52	3.36	0.33	0.92	18.48

<sup>1</sup> No record.  
<sup>2</sup> Observations began September 1, 1883.

<sup>3</sup> Precipitation inappreciable.  
<sup>4</sup> Record incomplete.

<sup>1</sup> Observations began October 1, 1883.  
<sup>2</sup> Station opened.

Monthly and annual amount of precipitation, at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cedar Keys, Fla.....	5.09	3.87	2.77	0.23	0.93	0.32	5.06	1.54	2.21	2.56	1.96	6.68
Charleston, S. C.....	8.93	10.05	2.36	1.83	1.06	2.81	5.89	4.29	4.39	2.18	2.18	8.25
Charlotte, N. C.....	5.23	2.00	4.00	4.31	4.65	3.13	7.60	6.43	9.30	3.45	2.18	8.25
Chattanooga, Tenn.....	2.05	5.81	3.40	3.93	3.79	3.82	5.88	8.81	10.19	2.22	4.84	9.47
Cheyenne, Wyo.....	1.45	2.16	0.90	1.66	0.16	0.80	0.76	0.26	1.56	1.35	2.23	9.20
Chicago, Ill.....	5.53	1.21	1.26	7.36	5.26	1.59	1.39	3.27	5.16	1.33	4.83	1.50
Chicago, Fort (Ugava Bay), Labrador.....	4.10	4.04	4.82	3.87	0.44	0.31	0.78	0.29	7.51	0.84	2.02	2.11
Chincoteague, Va.....	5.82	7.43	4.05	6.65	4.27	1.92	4.80	5.84	7.81	2.02	1.53	5.46
Cincinnati, Ohio.....	2.21	2.10	1.83	3.39	1.81	0.61	2.21	8.87	2.63	1.03	1.13	2.77
Cleveland, Ohio.....	2.72	2.72	4.03	3.56	5.26	2.82	1.55	5.27	1.87	1.75	5.56	3.29
Coeur d'Alene, Fort, Idaho.....	0.00	0.08	0.16	2.55	5.26	2.82	2.02	1.34	0.85	0.66	0.66	1.69
Columbus, Ohio.....	2.75	2.54	2.43	6.11	3.87	4.13	2.25	4.95	8.59	2.11	8.79	3.64
Concho, Fort, Tex.....	3.74	3.05	3.86	8.02	0.29	1.20	1.26	4.95	0.76	6.44	13.50	2.59
Craig, Fort, N. Mex.....	0.77	1.01	0.46	0.97	0.29	1.87	(1) 1.10	0.04	0.09	0.31	0.19	0.87
Custer, Fort, Mont.....	2.65	1.02	0.72	5.13	1.10	1.87	2.85	1.29	1.02	0.77	0.19	1.10
Davenport, Iowa.....	3.63	3.07	1.49	0.42	3.68	0.08	0.75	0.98	3.37	0.77	2.79	3.07
Dayton, Fort, Tex.....	0.00	0.80	0.09	1.44	0.85	0.81	0.48	0.00	0.28	1.63	1.06	2.78
Dayton, Wash. T.....	1.88	1.32	0.11	0.80	0.45	1.01	3.14	5.66	1.79	0.81	0.81	2.02
Deadwood, Dak.....	1.88	1.89	2.63	5.12	1.58	2.26	0.85	1.01	2.61	2.29	1.72	2.51
Delaware Breakwater, Del.....	2.27	0.75	1.63	1.49	0.33	2.32	0.22	6.14	6.71	1.82	0.89	1.37
Denver, Colo.....	3.37	2.68	1.88	4.42	1.82	2.32	0.86	0.86	0.93	2.33	4.61	1.47
Des Moines, Iowa.....	5.29	0.90	1.50	2.55	2.24	1.08	0.85	1.92	2.24	2.97	2.36	3.84
Detroit, Mich.....	2.61	2.68	1.32	2.67	2.67	2.67	2.06	3.39	2.81	1.54	2.88	1.92
Dodge City, Kans.....	7.90	2.70	2.09	4.44	1.65	1.88	0.99	0.28	2.85	2.77	4.86	7.67
Dubuque, Iowa.....	2.48	0.98	2.21	3.19	1.63	2.02	0.67	2.71	1.32	5.17	6.79	4.02
Duluth, Minn.....	9.07	0.49	2.49	8.41	3.76	4.43	4.37	9.38	3.74	6.53	6.79	1.18
Elkton, Fort, Tex.....	2.87	0.56	4.97	5.52	0.04	0.84	0.61	0.27	0.34	1.08	6.86	6.86
El Paso, Tex.....	2.84	2.44	2.51	2.03	0.81	2.74	4.55	0.84	0.33	0.91	(2) 6.29	0.11
Eric, Pa.....	3.94	2.44	2.92	4.41	3.03	1.67	4.89	5.88	2.84	1.90	2.43	2.43
Fort Smith, Ark.....	4.74	1.17	2.92	3.98	3.03	2.87	4.55	2.75	1.10	2.60	3.69	2.62
Galveston, Tex.....	1.83	1.03	2.32	7.29	4.74	3.00	1.11	10.72	2.33	2.63	2.70	3.92
Grand Forks, N. Dak.....	1.83	1.03	2.32	7.29	4.74	3.00	1.11	10.72	2.33	2.63	2.70	3.92
Grant, Fort, Ariz.....	1.83	1.03	2.32	7.29	4.74	3.00	1.11	10.72	2.33	2.63	2.70	3.92
Hatteras, N. C.....	1.83	1.03	2.32	7.29	4.74	3.00	1.11	10.72	2.33	2.63	2.70	3.92
Idaho, Mont.....	1.83	1.03	2.32	7.29	4.74	3.00	1.11	10.72	2.33	2.63	2.70	3.92

Huron, Dak	2.20	1.77	1.69	1.96	0.65	0.61	0.09	0.88	1.83	2.70	1.90	22.25
Indianapolis, Ind	6.43	7.32	7.23	7.26	5.71	4.74	4.73	4.73	5.01	7.80	7.80	51.61
Indianapolis, Tex	6.84	7.33	7.23	7.26	5.71	4.74	4.73	4.73	5.01	7.80	7.80	24.85
Jacksonville, Fla	3.15	1.83	1.76	1.87	2.09	1.20	0.85	1.88	2.37	2.82	2.82	31.07
Kearney, Neb	1.61	6.08	5.73	6.05	0.64	0.97	0.85	1.70	0.17	0.86	0.86	43.91
Kearney, W. Va	3.96	12.89	7.73	8.50	1.65	2.89	6.96	4.33	11.63	1.75	1.75	58.53
Kitty Hawk, N. C	2.59	2.48	2.53	4.06	0.43	0.35	0.53	8.51	4.44	4.44	4.44	59.85
Knoxville, Tenn	11.03	1.71	4.92	1.68	(1) 0.84	1.06	2.70	1.42	1.13	1.82	(1)	32.38
La Crosse, Wis					(1) 0.84	1.06	2.70	1.42	1.13	1.82	(1)	32.38
Lake View, Oreg					0.09	0.97	0.97	1.43	3.70	4.79	4.79	37.03
Leavenworth, Kans	3.58	1.95	1.57	8.31	2.02	1.86	2.15	3.10	2.13	1.45	1.45	10.21
Leavenworth, Idaho	(1)	(1)	0.04	1.84	1.86	1.86	2.15	3.10	2.13	1.45	1.45	10.21
Linkville, Oreg					1.45	2.64	5.88	6.03	4.96	0.97	0.97	40.58
Little Egg Harbor, N. J	3.96	2.51	3.81	4.45	3.13	2.89	3.45	13.87	12.86	10.24	10.24	61.03
Little Rock, Ark	4.88	3.80	3.67	5.55	0.00	2.89	3.45	13.87	12.86	10.24	10.24	88.22
Los Angeles, Cal	(1)	0.00	0.00	1.43	0.00	4.86	1.94	9.76	8.76	5.75	5.75	52.67
Los Angeles, Ky	4.74	0.86	0.82	8.05	6.05	4.86	1.94	9.76	8.76	5.75	5.75	52.67
Lynchburg, Va	0.19	1.87	5.57	4.47	1.14	(1)	8.48	9.03	8.14	1.21	1.21	4.16
Lyonsburg, Va	4.85	1.95	2.08	2.40	(1)	1.88	8.06	5.10	4.10	1.67	1.67	47.57
Maclean, City Mich	6.71	3.80	12.69	2.53	0.51	0.89	5.73	2.84	4.10	2.47	2.47	12.19
Macon, Fort, N. C	0.23	0.37	0.66	4.06	1.13	1.96	1.47	0.69	0.58	0.63	0.63	1.21
Magnum, Fort, Mont					(1) 0.00	1.96	1.47	0.74	0.74	2.84	2.84	0.01
Marathon, Wis					2.88	2.81	0.91	2.05	0.74	2.84	2.84	0.01
Marquette, Mich	4.04	2.11	3.24	2.53	(1) 0.88	(1) 4.81	0.91	2.05	0.74	2.84	2.84	0.01
McDowell, Fort, Ariz					4.56	4.86	5.66	9.64	5.08	3.60	3.60	0.45
Memphis, Tenn	1.73	1.85	1.05	8.56	1.81	1.96	5.66	9.64	5.08	3.60	3.60	0.45
Milwaukee, Wis	7.18	0.88	2.82	1.52	1.81	1.96	5.66	9.64	5.08	3.60	3.60	0.45
Mobile, Ala	3.81	5.88	0.96	0.64	2.87	3.11	7.40	5.01	11.53	8.15	8.15	1.67
Montgomery, Ala	0.87	2.08	0.23	2.00	1.70	4.23	4.82	4.80	1.50	1.18	1.18	61.64
Montgomery, Minn	4.57	8.16	2.51	5.25	0.16	1.47	0.55	7.55	1.08	1.28	1.28	22.81
Mount Washington, N. H	11.14	6.06	6.90	5.55	3.72	2.66	2.45	7.55	1.08	1.28	1.28	22.81
Narragansett Pier, R. I	0.09	1.13	1.80	8.14	5.11	2.75	6.05	5.80	5.24	4.69	4.69	54.87
Nashville, Tenn	4.88	4.47	2.23	5.37	8.11	4.97	7.20	5.80	5.24	4.69	4.69	54.87
Nashville, Wash T					(1) 11.83	4.97	7.20	5.80	5.24	4.69	4.69	54.87
New Bay, Wash T					1.56	3.85	4.63	5.87	3.60	3.20	3.20	45.93
New Haven, Conn	5.67	1.26	2.43	5.87	3.85	3.85	4.63	5.87	3.60	3.20	3.20	45.93
New London, Conn	7.84	2.76	3.24	7.33	3.36	3.62	6.12	5.87	3.60	3.20	3.20	45.93
New Orleans, La	3.33	4.12	0.25	8.43	3.36	3.62	6.12	5.87	3.60	3.20	3.20	45.93
New River Inlet, N. C	5.94	(1)	7.41	3.20	0.56	2.31	6.91	4.91	3.24	6.48	6.48	54.12
New York City	3.87	2.29	3.57	4.27	1.65	2.31	6.91	4.91	3.24	6.48	6.48	54.12
Norfolk, Va	3.87	2.91	6.63	3.79	0.53	2.40	6.91	4.91	3.24	6.48	6.48	54.12
North Platte, Neb	1.38	4.51	1.08	3.47	0.43	1.43	5.94	4.91	3.24	6.48	6.48	54.12
Ocean City, Md	2.81	3.24	4.81	3.47	0.35	1.93	5.46	4.91	3.24	6.48	6.48	54.12
Olympia, Wash T	(1)	0.01	2.24	(1)	5.10	1.93	5.46	4.91	3.24	6.48	6.48	54.12
Omaha, Neb	4.79	3.89	4.53	3.73	5.04	6.14	5.46	4.91	3.24	6.48	6.48	54.12
Oswego, N. Y	3.21	3.39	2.83	5.03	3.02	4.06	6.49	4.91	3.24	6.48	6.48	54.12
Palestine, Tex	1.28	2.16	2.83	1.94	7.09	2.80	2.81	2.47	2.63	7.30	7.30	17.25
Pensacola, Fla	3.29	0.80	0.82	4.47	3.08	5.80	3.69	2.47	2.63	7.30	7.30	17.25
Philadelphia, Pa	1.78	3.40	0.82	1.91	1.84	2.78	5.46	4.91	3.24	6.48	6.48	54.12
Phoenix, Ariz	0.07	0.07	0.00	0.20	1.00	2.86	5.46	4.91	3.24	6.48	6.48	54.12
Pike's Peak, Colo	5.37	2.23	1.76	0.15	0.07	2.73	0.16	2.46	2.14	0.43	0.43	2.90
Pittsburg, Pa	5.52	2.47	2.47	2.43	1.50	2.40	0.10	0.76	2.71	1.11	1.11	38.12

\* Record incomplete.

\* No record.

\* Precipitation inappreciable.

\* Station opened.



Stockton, Fort, Tex	2.64	0.85	14.08	0.51	1.29	0.88	0.21	0.98	0.12	0.01	1.08	2.84	27.45
Sully, Fort, Dak	( <sup>10</sup> )			( <sup>11</sup> ) 1.37	0.00	1.18	0.88	0.35	( <sup>10</sup> )	0.14	0.30	( <sup>7</sup> )	
Tatoosh Island, Wash T	4.46	2.67	0.78	5.47	15.83	10.45	12.22	0.35	2.41	2.31	4.45	2.98	
Thatcher's Island, Mass	1.85	2.62	( <sup>7</sup> )	0.52	3.40	0.29	7.04	7.04	4.70	3.21	4.39	2.79	51.88
Thomas, Camp, Ariz	4.36	1.51	2.78	3.68	0.00	1.07	0.45	2.94	3.21	0.72	0.60	0.52	14.40
Toledo, Ohio					3.03	1.90	2.61	3.03	2.09	1.57	4.71	2.70	83.87
Totten, Fort, Dak							40.23	0.08	0.08	2.38	1.20	2.00	
Unalaksha, Alaska	1.70	4.74	0.75	6.15	5.02	11.64	11.83	26.19	9.44	14.00	3.97	12.41	118.94
Verde, Fort, Ariz	3.35	1.14	0.00	0.45	0.00	4.80	0.39	3.09	3.90	1.43	0.72	0.23	19.20
Vicksburg, Miss	3.61	1.86	0.84	4.84	11.53	9.42	3.20	0.73	3.29	4.47	1.76	3.14	74.09
Washington City	4.73	3.30	4.53	2.63	1.19	2.89	0.59	0.84	7.24	1.86	3.09	0.95	50.64
Wash Woods, N. C	3.63	5.77	4.43	2.85	0.79	2.06	5.53	3.05	5.20	0.22	0.54	2.44	38.53
West Las Animas, Colo	0.67	0.65	1.35	0.69	0.21	1.03	0.28	0.50	1.19	1.05	4.46	2.79	15.50
Wickburg, Ariz				( <sup>7</sup> ) 0.22	0.00	4.06	0.19	4.21	3.67	1.24	0.61	0.06	
Willcox, Ariz					( <sup>7</sup> ) 0.00	0.86	0.80	1.61	1.75	0.00	0.00	0.00	
Winnington, N. C	4.71	5.19	16.53	1.09	0.42	1.32	0.80	3.80	6.07	2.45	3.70	7.94	58.34
Yankton, Dak	3.33	2.85	3.96	1.98	0.08	0.91	0.23	1.80	0.92	5.73	1.43	1.72	24.94
Yates, Fort, Dak	2.25	0.67	0.04	1.08	0.16	1.96	0.58	1.24	0.23	0.72	0.62	2.75	12.51
Yuma, Ariz	0.31	0.23	0.13	0.05	0.00	( <sup>10</sup> )	( <sup>7</sup> )	1.58	1.48	0.07	0.41	( <sup>7</sup> )	

<sup>9</sup> Observations re-commenced July 20, 1883.

<sup>10</sup> No record.

<sup>11</sup> Observations began October 1, 1883.

\* Station opened.

\* Precipitation inappreciable.

\* Observations discontinued April 1, 1884.

\* Observations re-commenced October 10, 1883.

1 23 days only.

\* Record incomplete.

\* 20 days only.

\* 19 days only.



Davis, Fort Tex	Dec. 34, 1877	21.41	23.48	(1)	20.22	14.22	19.83
Dayton, Wash	July 25, 1879	28.50	19.20	27.70	33.62	21.44	28.11
Deadwood, Dak	Dec. 28, 1880	15.51	16.88	30.12	33.83	28.60	31.47
Delaware, Chesapeake, Del	Jan. 28, 1880	11.81	13.46	17.25	33.85	33.84	8
Denver, Colo	Nov. 19, 1871	34.32	38.43	35.71	35.85	19.69	14.98
Des Moines, Iowa	Aug. 1, 1878	23.63	26.43	35.71	32.82	17.49	42.72
Detroit, Mich	Nov. 1, 1870	30.80	35.23	40.40	32.82	47.60	39.19
Dodge City, Kans	Sept. 15, 1874	30.80	35.23	40.40	32.82	47.60	39.19
Dodge City, Kans	Nov. 1, 1870	30.80	35.23	40.40	32.82	47.60	39.19
Durham, N. C	July 10, 1873	30.12	38.73	32.27	35.85	39.57	10
Durham, N. C	Nov. 1, 1873	30.12	38.73	32.27	35.85	39.57	10
Elkhart, Ind	Apr. 1, 1873	42.56	45.42	57.99	42.56	53.17	40
Elkhart, Fort Tex	Nov. 28, 1879	37.83	41.20	41.65	38.96	21.76	49.02
El Paso, Tex	Nov. 5, 1877	37.83	41.20	41.65	38.96	21.76	49.02
El Paso, Tex	Nov. 25, 1873	31.12	43.54	42.44	36.25	46.37	12
Euclid, Mich	May 24, 1871	32.60	27.06	42.44	36.25	46.37	12
Euclid, Mich	June 1, 1882	41.72	58.91	58.48	50.92	40.07	1
Fort Smith, Ark	May 10, 1871	32.60	27.06	42.44	36.25	46.37	12
Galveston, Tex	Apr. 24, 1871	32.60	27.06	42.44	36.25	46.37	12
Grand Haven, Mich	May 24, 1871	32.60	27.06	42.44	36.25	46.37	12
Grant, Fort Ariz	Nov. 1, 1875	32.60	27.06	42.44	36.25	46.37	12
Grant, Fort Ariz	Dec. 1, 1880	32.60	27.06	42.44	36.25	46.37	12
Helena, Mont	Oct. 15, 1879	32.60	27.06	42.44	36.25	46.37	12
Huron, Dak	July 10, 1881	32.60	27.06	42.44	36.25	46.37	12
Indianapolis, Ind	Feb. 10, 1871	34.12	52.83	43.94	54.58	23.25	2
Indianapolis, Ind	May 1, 1874	43.30	44.51	35.39	33.57	47.59	12
Jacksonville, Fla	Sept. 11, 1871	57.17	60.65	42.31	55.28	38.22	11
Kearney, Neb	July 16, 1871	29.37	41.04	35.77	49.42	55.35	12
Kearney, Neb	Nov. 1, 1870	31.77	32.75	32.75	38.35	38.67	12
Kitty Hawk, N. C	Jan. 15, 1875	44.22	50.38	58.38	73.87	41.16	8
Knoxville, Tenn	Oct. 1, 1871	44.22	50.38	58.38	73.87	41.16	8
La Crosse, Wis	Jan. 1, 1871	44.22	50.38	58.38	73.87	41.16	8
Leavenworth, Kans	Oct. 15, 1873	44.22	50.38	58.38	73.87	41.16	8
Leavenworth, Kans	May 21, 1871	43.50	35.27	35.81	31.26	38.49	12
Lewiston, Idaho	July 1, 1879	43.50	35.27	35.81	31.26	38.49	12
Little Rock, Ark	July 1, 1877	43.50	35.27	35.81	31.26	38.49	12
Los Angeles, Cal	July 1, 1877	43.50	35.27	35.81	31.26	38.49	12
Louisville, Ky	Sept. 11, 1871	43.50	35.27	35.81	31.26	38.49	12
Lynchburg, Va	May 24, 1871	30.56	45.77	43.69	53.21	33.69	12
Macomb, Fort N. C	May 24, 1871	30.56	45.77	43.69	53.21	33.69	12
Macomb, Fort N. C	May 24, 1878	30.56	45.77	43.69	53.21	33.69	12
Marquette, Mich	May 1, 1871	30.56	45.77	43.69	53.21	33.69	12
Memphis, Tenn	Feb. 28, 1871	30.56	45.77	43.69	53.21	33.69	12
Memphis, Tenn	Nov. 1, 1870	30.56	45.77	43.69	53.21	33.69	12
Milwaukee, Wis	Nov. 1, 1870	30.56	45.77	43.69	53.21	33.69	12
Mobile, Ala	Nov. 1, 1870	30.56	45.77	43.69	53.21	33.69	12
Montgomery, Ala	Nov. 1, 1870	30.56	45.77	43.69	53.21	33.69	12
Moorehead, Minn	Jan. 1, 1881	30.56	45.77	43.69	53.21	33.69	12
Mount Washington, N. H	Dec. 1, 1870	30.56	45.77	43.69	53.21	33.69	12
Nashville, Tenn	Nov. 1, 1870	30.56	45.77	43.69	53.21	33.69	12
New Haven, Conn	Dec. 10, 1872	30.56	45.77	43.69	53.21	33.69	12
New London, Conn	Dec. 10, 1871	30.56	45.77	43.69	53.21	33.69	12
New Orleans, La	Nov. 1, 1870	30.56	45.77	43.69	53.21	33.69	12

No record.

Record incomplete.



Annual and mean annual precipitation at stations of the Signal Service, United States Army—Continued.

Stations.	Established.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	Mean annual.	
														Years.	Inches.
New York City.	Nov. 1, 1870	Inches. 45.70	Inches. 38.98	Inches. 40.81	Inches. 45.09	Inches. 47.40	Inches. 40.94	Inches. 46.67	Inches. 34.13	Inches. 37.34	Inches. 40.40	Inches. 46.61	Inches. 33.83	12	42.17
Norfolk, Va.	Jan. 1, 1871	54.95	55.43	50.41	50.97	46.54	50.13	51.87	35.98	51.84	40.08	57.97	54.30	12	51.76
North Platte, Nebr.	Sept. 18, 1874				15.35	11.84	25.47	18.62	22.93	17.95	17.95	17.95	30.01	12	19.87
Olympia, Wash.	July 1, 1877													6	59.72
Omaha, Nebr.	Nov. 1, 1870	32.48	27.04	25.75	42.99	32.51	40.95	37.06	73.44	62.77	65.56	51.59	41.61	12	85.63
Owego, N. Y.	Nov. 1, 1870	27.61	33.29	34.98	31.41	34.20	32.20	55.83	36.60	43.49	39.25	36.13	34.49	12	38.59
Palestine, Tex.	Dec. 1, 1881													1	43.49
Penascola, Fla.	Oct. 27, 1879	48.36	55.28	46.25	40.23	47.39	37.28	34.53	36.75	61.90	39.02	72.01	61.55	4	70.22
Philadelphia, Pa.	Jan. 1, 1871													12	41.23
Phoenix, Ariz.	Aug. 18, 1876			26.86	21.74	22.87	25.58	42.87	39.83	40.65	44.57	26.82	18.17	6	7.00
Pike's Peak, Colo.	Nov. 1, 1870	31.06	41.42	39.42	34.06	37.01	34.72	38.76	37.03	31.97	37.80	38.63	43.17	10	31.60
Pittsburg, Pa.	Nov. 1, 1870													12	37.04
Poplar River, Mont.	May 1, 1882													1	6.23
Port Huron, Mich.	July 25, 1874				22.14	37.16	31.61	38.91	37.54	38.68	35.27	41.04	36.98	9	35.28
Portland, Me.	Jan. 15, 1871	37.62	38.90	36.24	33.14	39.04	43.51	33.60	41.81	37.59	40.68	38.74	31.99	12	33.67
Portland, Oreg.	Jan. 1, 1871	45.90	50.52	46.17	60.08	16.16		47.70	62.23	51.87	58.05	67.24	51.45	12	54.64
Prescott, Ariz.	Nov. 19, 1873							15.63	12.99	10.02	15.45	15.26	16.13	7	14.51
Provincetown, Mass.	Feb. 16, 1882													1	40.39
Red Bluff, Cal.	July 1, 1877							45.96	33.64	26.33	24.93	21.82	13.76	6	28.27
Rio Grande City, Tex.	May 28, 1875							24.43	25.61	22.31	28.13	( <sup>1</sup> )	( <sup>1</sup> )	4	25.12
Rochester, N. Y.	Nov. 1, 1870	30.29	49.89	35.62	29.93	35.82	34.12	45.81	35.23	41.90	38.24	24.73	( <sup>1</sup> )	11	37.32
Roseburg, Oreg.	July 15, 1877							36.92	45.03	31.44	43.68	34.77	22.48	6	36.73
Sacramento, Cal.	July 1, 1877							23.45	22.87	31.90	20.71	18.06	13.48	6	21.68
Saint Louis, Mo.	Nov. 1, 1870	30.40	45.03	37.88	42.99	47.74	41.26	40.83	25.70	34.56	37.37	13.15	40.10	12	38.93
Saint Michael's Fort, Alaska	June 28, 1874							9.37	16.18	7.26	16.61	8.20	21.73	6	12.23
Saint Paul, Minn.	Nov. 1, 1870	( <sup>1</sup> )	34.75	35.51	30.66	22.67	28.80	22.78	32.89	26.76	39.16	23.48	26.70	11	28.76
Saint Vincent, Minn.	Sept. 5, 1880													3	18.63
Salt Lake City, Utah	Mar. 19, 1874													9	16.91
San Carlos Agency, Ariz.	June 1, 1871	6.04	13.01	10.91	6.80	7.24	8.12	13.87	14.71	10.87	5.00	9.74	8.01	2	13.78
San Diego, Cal.	Nov. 1, 1871							53.65	61.70	56.50	41.06	42.63	( <sup>1</sup> )	12	9.48
Sandusky, Ohio.	Aug. 2, 1877													10	51.26
Sandy Hook, N. J.	Dec. 1, 1873													10	32.90
Sanford, Fla.	Sept. 1, 1882													12	52.13
San Francisco, Cal.	Mar. 8, 1871	22.45	18.55	25.52	22.63	21.54	11.93	33.76	30.76	30.07	22.73	16.67	16.43	12	18.97
Seawanh, Ga.	Jan. 1, 1871	63.67	48.39	57.43	46.05	64.65	59.60	52.56	40.81	50.36	38.90	47.35	13.48	12	33.11
Shreveport, La.	Apr. 1, 1880													12	63.11
Sibley, Minn.	July 28, 1874	61.03	53.27	54.80	50.96	54.49	47.71	33.69	31.97	30.76	38.23	31.13	102.57	2	102.30
Sioux Falls, S. D.	Mar. 28, 1871													2	102.30
Smithville, N. C.	Oct. 16, 1875	54.23	54.23	54.23	54.23	54.23	54.23	54.23	54.23	54.23	54.23	54.23	54.23	2	102.30

### REPORT OF THE CHIEF SIGNAL OFFICER.

303

[illegible]

**Record incomplete.**



[illegible]

**Precipitation inappreciable.**

Table of comparative precipitation, in inches and hundredths, at selected stations of the Signal Service, United States Army—Continued.

Stations.	January.			February.			March.			April.			May.			June.		
	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.
North Platte, Nebr.	0.59	1.20	+0.61	0.29	1.38	+1.09	0.51	0.47	-0.04	1.64	2.11	+1.47	2.06	2.79	+0.73	2.54	7.49	+3.95
Olympia, Wash. T.	10.10	5.66	-4.42	12.17	3.18	-8.99	6.84	2.99	-3.85	3.06	10.78	+7.72	4.79	2.80	-1.99	1.29	0.21	-9.89
Omaha, Nebr.	0.51	1.01	+0.50	0.76	1.09	+0.33	1.39	0.52	-0.87	3.32	3.78	+0.46	2.79	2.80	+0.01	0.29	1.20	+0.91
Owego, N. Y.	2.05	1.16	-0.89	2.53	2.12	-0.41	2.29	0.84	-1.45	2.19	1.84	-0.35	2.46	1.23	-1.23	2.65	4.58	+1.93
Panama, Fla.	3.18	2.97	-0.21	2.62	2.12	-0.50	2.29	2.02	-0.27	2.19	1.74	-0.45	2.86	2.86	+0.00	2.42	4.58	+2.16
Philadelphia, Pa.	3.18	4.14	+0.96	2.64	5.04	+2.40	3.38	2.02	-1.36	3.22	1.68	-1.54	2.78	2.78	+0.00	1.04	5.91	+2.73
Pike's Peak, Colo.	1.89	0.54	-1.35	1.43	0.49	-0.94	2.31	0.61	-1.70	2.83	1.68	-1.15	2.47	2.47	+0.00	1.04	3.76	+2.72
Pittsburg, Pa.	2.84	3.23	+0.39	2.17	4.92	+2.75	3.09	2.51	-0.58	2.50	2.69	+0.19	2.78	2.78	+0.00	1.04	4.73	+3.69
Port Huron, Mich.	2.00	1.65	-0.35	2.10	4.00	+1.90	2.26	2.86	+0.60	2.33	1.26	-1.07	2.94	2.94	+0.00	2.78	5.71	+2.93
Portland, Maine.	3.28	2.53	-0.75	2.92	2.81	-0.11	3.26	1.58	-1.68	2.83	1.88	-0.95	2.91	2.91	+0.00	2.78	5.71	+2.93
Portland, Ore.	4.76	6.95	+2.19	3.68	2.84	-0.84	7.35	6.40	-0.95	3.09	7.88	+4.79	2.91	2.91	+0.00	1.04	2.84	+1.80
Prescott, Ariz.	1.81	0.87	-0.94	0.63	0.63	0.00	2.59	2.60	+0.01	3.07	1.96	-1.11	1.67	1.67	+0.00	1.86	6.66	+4.80
Red Bluff, Cal.	7.63	0.87	-6.76	5.74	0.39	-5.35	1.53	0.44	-1.09	2.07	1.10	-0.97	1.91	1.91	+0.00	2.06	6.09	+4.03
Rio Grande City, Tex.	1.26	0.94	-0.32	0.91	2.26	+1.35	1.53	0.44	-1.09	2.07	1.10	-0.97	1.91	1.91	+0.00	2.06	6.09	+4.03
Rochester, N. Y.	1.26	0.94	-0.32	0.91	2.26	+1.35	1.53	0.44	-1.09	2.07	1.10	-0.97	1.91	1.91	+0.00	2.06	6.09	+4.03
Roseburg, Ore.	7.73	2.98	-4.75	5.68	1.17	-6.51	4.51	1.65	-2.86	2.72	1.10	-1.62	2.04	2.04	+0.00	1.86	6.66	+4.80
Sacramento, Cal.	4.42	7.73	+3.31	4.24	1.11	-3.13	2.96	1.73	-1.23	2.93	2.67	-0.26	2.83	2.83	+0.00	1.86	6.66	+4.80
Saint Louis, Mo.	2.29	2.04	-0.25	2.87	5.88	+3.01	2.10	2.39	+0.29	3.35	3.31	+0.04	2.83	2.83	+0.00	1.86	6.66	+4.80
Saint Michael's, Fort, Alaska.	0.78	2.63	+1.85	0.11	0.34	+0.23	0.17	0.96	+0.79	0.55	4.92	+4.37	0.07	0.07	+0.00	0.86	5.54	+4.68
Saint Paul, Minn.	1.11	0.64	-0.47	1.13	0.44	-0.69	0.87	0.06	-0.81	1.86	4.92	+3.06	3.47	3.47	+0.00	0.86	5.54	+4.68
Saint Vincent, Minn.	0.44	0.33	-0.11	0.70	0.24	-0.46	0.77	0.11	-0.66	1.86	4.92	+3.06	3.47	3.47	+0.00	0.86	5.54	+4.68
Salt Lake City, Utah.	1.86	1.47	-0.39	1.33	0.73	-0.60	1.85	0.41	-1.44	0.71	0.81	-0.10	1.33	1.33	+0.00	0.86	5.54	+4.68
Salt Lake City, Utah.	1.86	1.47	-0.39	1.33	0.73	-0.60	1.85	0.41	-1.44	0.71	0.81	-0.10	1.33	1.33	+0.00	0.86	5.54	+4.68
Sandusky, Ohio.	1.92	1.09	-0.83	2.03	0.96	-1.07	1.03	0.69	-0.34	2.79	0.81	-1.98	1.14	1.14	+0.00	0.86	5.54	+4.68
Sandy Hook, N. J.	2.42	1.01	-1.41	2.39	4.12	+1.73	1.03	0.69	-0.34	2.79	0.81	-1.98	1.14	1.14	+0.00	0.86	5.54	+4.68
San Francisco, Cal.	4.18	2.85	-1.33	2.80	4.22	+1.42	3.94	1.45	-2.49	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
Savannah, Ga.	5.28	1.92	-3.36	4.23	1.04	-3.19	3.94	1.45	-2.49	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
Shaw, Fort, Mont.	1.04	0.54	-0.50	0.90	0.81	-0.09	4.12	3.81	-0.31	1.51	1.51	+0.00	3.89	3.89	+0.00	4.04	4.34	+0.30
Shreveport, La.	1.48	2.54	+1.06	0.90	0.81	-0.09	4.12	3.81	-0.31	1.51	1.51	+0.00	3.89	3.89	+0.00	4.04	4.34	+0.30
Sill, Fort, Ind. T.	1.24	0.40	-0.84	0.90	0.81	-0.09	4.12	3.81	-0.31	1.51	1.51	+0.00	3.89	3.89	+0.00	4.04	4.34	+0.30
Sikeston, Mo.	4.09	2.85	-1.24	1.41	2.27	+0.86	4.07	1.69	-2.38	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
Spokane Falls, Wash. T.	2.84	0.40	-2.44	1.41	2.27	+0.86	4.07	1.69	-2.38	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
Springfield, Ill.	2.01	0.40	-1.61	1.41	2.27	+0.86	4.07	1.69	-2.38	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
St. Louis, Mo.	2.84	0.40	-2.44	1.41	2.27	+0.86	4.07	1.69	-2.38	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
Texas Station, Tex.	2.01	0.40	-1.61	1.41	2.27	+0.86	4.07	1.69	-2.38	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30
Tulsa, Okla.	1.07	0.40	-0.67	0.90	0.81	-0.09	4.07	1.69	-2.38	4.57	6.79	+2.22	3.89	3.89	+0.00	4.04	4.34	+0.30

Unalakleet, Alaska.....	7.10	17.78	+10.68	4.21	2.88	-1.33	4.13	10.36	+6.23	2.10	5.77	+3.67	3.46	10.85	+7.30	2.63	1.48	-1.20
Verde, Fort, Ariz.....	0.63	0.44	-0.28	0.40	1.35	+0.96	0.95	1.63	+0.68	0.67	0.12	-0.55	0.33	0.27	-0.08	0.80	0.04	-0.32
Vicksburg, Miss.....	5.06	7.65	+2.59	5.07	6.70	+1.63	7.16	2.19	+3.97	7.13	6.99	-0.14	5.45	2.16	-3.29	3.75	4.96	+1.21
Washington City.....	3.16	3.15	-0.01	2.60	5.09	+2.43	4.11	3.27	+0.84	2.90	4.00	+1.10	3.02	2.60	-0.52	2.87	8.55	+4.68
Washington, N. O.....	3.64	6.33	+2.69	2.33	2.09	-1.44	4.21	5.78	+1.57	3.80	5.01	+1.71	4.11	4.79	+0.68	5.53	10.84	+5.32
Yankton, Dak.....	0.56	1.06	+0.50	0.80	0.73	-0.07	1.21	1.43	+0.21	2.58	5.71	+2.13	4.48	3.76	+4.28	5.53	4.40	-1.12
Yuma, Ariz.....	0.35	0.96	+0.61	0.49	0.68	+0.19	0.09	(1)	+0.09	0.10	(1)	-0.10	0.01	0.00	-0.01	0.01	0.00	-0.01

1 Precipitation inappreciable.

2 No record.







Table of comparative precipitation, in inches and hundredths, at selected stations of the Signal Service, United States Army—Continued.

Stations.	July.			August.			September.			October.			November.			December.		
	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.	Average for 1882.	Amount for 1883.	Excess or deficiency or —.
Olympia, Wash.	1.00	(1)	-1.00	0.97	0.01	-0.96	3.11	2.24	-0.87	3.73	2.91	-0.82	3.67	3.10	-0.57	11.00	9.14	-1.86
Omaha, Nebr.	1.08	4.79	-0.89	3.24	0.00	-0.15	3.41	4.53	+1.12	5.03	5.03	+0.00	1.50	0.64	-0.86	1.04	0.73	-0.31
Owego, N. Y.	3.39	3.21	-0.18	2.54	2.16	-0.38	2.54	2.32	-0.22	1.94	1.94	+0.00	3.38	3.02	-0.36	3.71	4.08	+0.37
Pensacola, Fla.	9.67	8.29	-1.38	13.86	8.75	-5.11	9.50	9.32	-0.18	1.91	1.91	+0.00	4.70	3.06	-1.64	5.82	5.80	-0.02
Philadelphia, Pa.	4.63	1.78	-2.85	5.18	3.40	-1.78	3.68	4.24	+0.56	4.20	4.20	+0.00	3.43	1.37	-2.06	2.52	2.76	+0.24
Pike's Peak, Colo.	4.90	5.37	+0.47	4.81	2.22	-2.59	2.11	1.76	-0.35	0.15	0.15	+0.00	2.31	0.07	-2.24	1.80	0.72	-1.08
Pittsburg, Pa.	4.81	5.52	+0.71	3.16	3.40	+0.24	2.79	2.47	-0.32	2.43	2.43	+0.00	2.61	1.50	-1.11	2.90	3.40	+0.50
Port Huron, Mich.	2.71	6.63	+3.92	3.19	0.59	-2.60	2.58	2.24	-0.34	3.61	3.61	+0.00	2.71	0.66	-2.05	1.80	1.80	+0.00
Portland, Me.	3.38	5.05	+1.67	3.58	0.36	-3.22	3.20	2.68	-0.52	3.03	3.03	+0.00	3.87	3.86	-0.01	2.91	2.68	-0.23
Portland, Ore.	0.77	0.00	-0.77	0.87	0.19	-0.68	1.70	0.67	-1.03	3.91	3.91	+0.00	3.87	0.74	-3.13	4.44	4.34	-0.10
Prewett, Ariz.	2.09	0.00	-2.09	1.11	3.53	2.42	0.33	1.04	+0.71	2.68	2.68	+0.00	0.61	(1)	-0.61	1.88	4.54	+2.66
Red Bluff, Cal.	0.02	0.00	-0.02	0.05	0.10	-0.05	0.33	1.04	+0.71	1.31	1.31	+0.00	2.06	0.74	-1.32	0.77	0.52	-0.25
Rio Grande City, Tex.	1.87	1.40	-0.47	3.90	0.10	-3.80	2.05	4.88	+2.83	3.52	3.52	+0.00	2.98	1.70	-1.28	1.65	1.07	-0.58
Rochester, N. Y.	3.52	(1)	-3.52	3.03	(1)	-3.03	2.86	(1)	-2.86	1.36	1.36	+0.00	1.37	0.86	-0.51	1.83	2.33	+0.50
Roseburg, Ore.	0.61	0.01	-0.60	0.51	0.03	-0.48	1.06	0.62	-0.44	2.84	2.84	+0.00	0.87	0.03	-0.84	1.66	1.07	-0.59
Sacramento, Cal.	(1)	0.00	-0.00	(1)	0.00	-0.00	0.19	0.90	+0.71	3.21	3.21	+0.00	4.03	2.20	-1.83	0.92	0.73	-0.19
Saint Louis, Mo.	4.36	4.31	-0.05	2.50	3.34	+0.84	2.76	0.01	-2.75	0.89	0.89	+0.00	1.46	0.61	-0.85	0.59	0.44	-0.15
Saint Michael's, Fort, Alaska	1.21	3.13	+1.92	2.39	3.80	+1.41	2.43	4.48	+2.05	5.54	5.54	+0.00	0.81	1.06	+0.25	2.23	2.72	+0.49
Saint Paul, Minn.	3.13	2.13	-1.00	4.05	1.23	-2.82	3.35	2.23	-1.12	1.90	1.90	+0.00	1.45	1.01	-0.44	0.71	0.70	-0.01
Saint Vincent, Minn.	2.14	2.16	+0.02	1.19	5.16	+3.97	1.90	1.57	-0.33	3.10	3.10	+0.00	1.54	0.26	-1.28	1.26	1.56	+0.30
Salt Lake City, Utah	0.68	0.10	-0.58	0.88	0.03	-0.85	0.61	0.13	-0.48	2.24	2.24	+0.00	1.54	1.78	+0.24	1.44	1.20	-0.24
San Diego, Cal.	0.02	0.00	-0.02	0.25	0.00	-0.25	0.05	0.00	-0.05	0.35	0.35	+0.00	0.70	0.20	-0.50	2.14	1.82	-0.32
Sandyhook, Ohio	4.06	(1)	-4.06	4.19	4.74	+0.55	3.46	4.07	+0.61	4.88	4.88	+0.00	0.64	3.92	+3.28	3.03	2.61	-0.42
Sandy Hook, N. J.	2.30	2.30	+0.00	4.80	3.44	-1.36	5.23	4.63	-0.60	3.13	3.13	+0.00	4.41	1.54	-2.87	3.83	3.57	-0.26
San Francisco, Cal.	0.01	0.00	-0.01	0.01	0.00	-0.01	0.12	0.42	+0.30	1.10	1.10	+0.00	2.79	1.00	-1.79	5.03	0.92	-4.11
Savannah, Ga.	4.98	4.56	-0.42	7.48	9.26	+1.80	5.53	2.55	-2.97	4.00	4.00	+0.00	2.77	0.58	-2.19	6.05	1.99	-4.06
Shaw, Fort, Mont.	1.55	0.15	-1.40	1.01	0.97	-0.04	1.93	0.79	-1.14	1.48	1.48	+0.00	1.36	0.88	-0.48	0.56	0.54	-0.02
Shreveport, La.	6.63	0.22	-6.41	2.13	0.72	-1.41	4.07	1.29	-2.78	2.23	2.23	+0.00	3.20	0.59	-2.61	4.10	3.77	-0.33
Sike, Fort, Ind. Ter.	3.89	2.30	-1.59	2.50	(1)	-2.50	3.01	1.44	-1.57	0.97	0.97	+0.00	5.56	0.88	-4.68	1.12	3.97	+2.85
Sitka, Alaska	6.38	6.38	+0.00	4.16	0.16	-4.00	10.89	8.13	-2.76	13.81	13.81	+0.00	1.93	10.63	+8.70	1.04	1.54	+0.50
Smithville, N. C.	2.20	2.53	+0.33	5.90	2.53	-3.37	6.53	4.69	-1.84	1.19	1.19	+0.00	3.50	0.26	-3.24	3.16	1.57	-1.59
Spokane Falls, Wash.	1.56	0.90	-0.66	0.90	0.90	+0.00	1.68	0.08	-1.60	1.48	1.48	+0.00	2.84	1.98	-0.86	2.98	0.91	-2.07
Stonington, Fort, Tex.	2.15	2.77	+0.62	3.20	0.95	-2.25	2.81	1.06	-1.75	0.66	0.66	+0.00	4.06	1.58	-2.48	3.46	1.12	-2.34
Thomas, Camp, Ariz.	1.03	0.13	-0.90	2.13	2.63	+0.50	4.19	1.06	-3.13	0.66	0.66	+0.00	0.97	0.00	-0.97	0.71	1.07	+0.36
Toledo, Ohio	1.73	4.24	+2.51	3.13	2.63	-0.50	2.73	2.73	+0.00	3.03	3.03	+0.00	3.97	0.00	-3.97	1.07	1.90	+0.83

Tulsa, Okla.....	2.18	1.70	-0.48	2.00	4.74	+2.74	7.74	9.72	+2.01	12.08	6.15	-5.91	7.98	5.05	-2.81	8.19	12.64	+5.45
Vicksburg, Miss.....	1.04	2.25	+1.41	2.90	1.14	-2.76	1.54	0.00	+1.54	0.54	0.45	-0.09	0.72	0.00	-0.72	1.20	4.80	+2.10
Wilmington, N. C.....	4.04	2.61	-0.43	2.99	1.86	-1.83	4.23	0.94	-2.49	2.63	4.84	+1.22	5.59	11.53	+0.94	4.94	2.49	+4.43
Washington, D. C.....	4.03	4.73	+0.70	5.11	2.80	-1.81	4.43	4.23	-2.10	2.03	2.63	-0.40	2.97	1.19	-1.73	2.53	2.89	-0.03
Wilmington, N. C.....	6.86	4.71	-1.65	5.16	2.19	-2.97	6.92	16.93	9.61	4.25	1.69	-2.16	2.03	0.43	-1.60	2.35	1.22	-2.03
Yankton, Dak.....	4.13	2.22	-0.65	2.67	2.85	+6.24	2.94	2.93	+1.14	1.77	1.83	+0.21	0.41	0.09	-0.23	0.74	0.61	-0.17
Yuma, Ariz.....	0.31	-0.21	+0.10	0.25	0.23	-0.03	0.06	0.13	+0.03	0.04	0.03	+0.01	0.03	0.09	-0.03	0.21	0.61	-0.17

Precipitation inappreciable.

No record.





Table showing the average precipitation at stations of the Signal Service, United States Army, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New Orleans, La.	Nov. 1, 1870	5.52	4.38	5.75	6.24	5.81	6.04	5.79	5.59	4.50	3.41	5.53	4.55
New York City	Nov. 1, 1870	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Norfolk, Va.	Nov. 1, 1870	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
North Platte, Nebr.	Jan. 18, 1874	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Olympia Wash. T.	July 1, 1877	9.36	10.67	9.20	4.84	5.29	6.78	8.04	2.30	2.66	1.29	2.25	2.89
Owensboro, Ky.	Nov. 1, 1870	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Owensboro, N. Y.	Nov. 1, 1870	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Palmetto, Tex.	Dec. 8, 1881	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Pensacola, Fla.	Oct. 27, 1879	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Philadelphia, Pa.	Jan. 1, 1871	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Pike's Peak, Colo.	Nov. 1, 1873	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Port Huron, Mich.	Nov. 1, 1873	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Portland, Me.	May 1, 1882	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Portland, Ore.	July 25, 1874	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Portland, Mich.	Jan. 15, 1871	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Portland, Ore.	Nov. 1, 1873	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Prescott, Ariz.	Nov. 19, 1882	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Provincetown, Mass.	Feb. 15, 1882	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Red Bluff, Cal.	July 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Rio Grande City, Tex.	May 28, 1875	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Rochester, N. Y.	Nov. 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Roseburg, Ore.	July 15, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Sacramento, Cal.	Nov. 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Saint Louis, Mo.	Nov. 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Saint Michael's, Fort, Alaska.	June 28, 1874	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Saint Paul, Minn.	Nov. 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Saint Vincent, Minn.	Sept. 5, 1880	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Salt Lake City, Utah	Mar. 19, 1874	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
San Diego, Cal.	Nov. 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Sandwich, Ohio	Aug. 16, 1873	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Sandwich, N. Y.	Nov. 1, 1877	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
San Francisco, Cal.	Sept. 1, 1882	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Savannah, Ga.	Mar. 8, 1871	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Shaw, W. Va.	Nov. 1, 1880	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Shaw, W. Va.	Nov. 1, 1880	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Shill, W. Va.	Nov. 1, 1871	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Sixth, Alaska	Nov. 1, 1881	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55
Smithville, N. O.	Oct. 15, 1871	5.50	5.23	4.07	3.25	2.74	3.32	4.46	4.30	4.03	3.41	5.53	4.55

Spokane Falls, Wash.	Feb. 5, 1881	2.34	2.02	0.95	1.99	1.38	1.00	1.04	0.25	1.14	2.80	2.72	2.82
Springfield, Ill.	Feb. 5, 1879	0.90	0.82	0.45	0.35	1.85	1.05	2.20	2.70	2.73	4.08	2.62	2.82
Stoughton, Mass.	Feb. 25, 1878	0.90	0.82	0.45	0.35	1.85	1.05	2.20	2.70	2.73	4.08	2.62	2.82
Stoughton, Mass.	Sept. 22, 1877	0.53	0.80	1.08	0.18	0.83	0.45	1.64	2.60	0.73	0.98	0.77	0.80
Stoughton, Mass.	Nov. 1, 1870	2.05	1.04	2.37	2.82	3.09	3.78	3.77	3.01	0.60	0.28	0.28	0.30
Stoughton, Mass.	Nov. 1, 1878	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Aug. 18, 1878	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Nov. 9, 1874	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Sept. 10, 1871	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Nov. 9, 1870	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Nov. 1, 1881	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Oct. 1, 1871	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Jan. 1, 1871	0.77	0.81	0.04	0.03	0.93	0.23	2.06	2.91	2.56	2.79	2.87	2.83
Stoughton, Mass.	Apr. 1, 1878	0.61	0.79	1.23	2.43	4.16	5.93	0.23	7.93	0.68	0.47	0.11	0.88
Stoughton, Mass.	Nov. 15, 1878	0.43	0.53	0.06	0.09	0.01	0.01	0.23	2.59	2.95	1.79	2.83	2.85
Stoughton, Mass.	Nov. 15, 1878	0.43	0.53	0.06	0.09	0.01	0.01	0.23	2.59	2.95	1.79	2.83	2.85

1 Inappreciable.

## APPENDIX 52.

Table showing the mean monthly and mean annual precipitation at selected stations of the Signal Service, United States Army, computed from January, 1874, to December, 1888, inclusive.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	2.72	2.74	2.64	2.87	2.98	4.31	4.48	3.16	3.65	3.12	2.49	2.71	38.06
Alpena, Mich.	2.10	2.26	2.13	1.80	4.11	3.82	3.69	3.67	2.82	2.90	3.09	2.20	38.92
Atlantic City, N. J.	3.66	3.06	2.96	3.59	2.85	4.28	2.99	4.23	3.62	2.83	3.38	4.02	42.18
Augusta, Ga.	4.65	3.64	3.58	3.07	2.81	4.28	4.36	4.79	4.14	2.83	3.96	4.06	49.15
Baltimore, Md.	3.29	3.18	4.20	4.44	2.69	4.33	4.21	4.05	4.54	2.92	2.91	3.49	42.86
Barnegat City, N. J.	4.96	3.33	4.09	4.09	3.62	3.92	4.07	4.85	4.45	3.58	4.38	4.31	51.74
Begton, Mass.	4.18	3.74	3.22	4.82	3.25	3.63	3.97	3.62	3.22	3.92	5.02	3.96	47.46
Buffalo, N. Y.	2.99	2.90	2.88	2.34	3.14	3.20	3.42	2.50	3.23	3.94	3.50	3.58	37.34
Calro, Ill.	4.64	4.47	4.50	4.24	4.10	3.90	3.42	3.13	2.20	3.43	4.74	4.48	47.86
Cape Henry, Va.	4.77	3.61	3.06	3.52	3.43	3.68	3.02	3.39	5.71	4.25	3.67	4.48	57.82
Cape May, N. J.	4.09	3.26	3.21	3.62	2.67	4.18	3.38	6.21	4.62	3.28	3.63	4.59	48.53
Charleston, S. C.	3.99	3.64	4.05	4.00	4.20	5.51	8.12	6.12	6.12	2.43	2.90	3.63	59.00
Cheyenne, Wyo.	1.91	2.18	1.54	1.00	1.23	1.26	1.71	1.40	91	88	2.25	2.21	10.67
Chicago, Ill.	2.69	2.68	2.68	3.45	3.82	5.53	4.19	2.84	2.99	4.32	3.22	3.66	38.53
Cincinnati, Ohio.	4.16	4.06	4.45	3.24	3.70	5.53	4.20	4.18	2.81	3.25	3.73	3.86	46.70
Cleveland, Ohio.	2.78	2.91	3.24	2.30	3.21	4.44	4.06	2.97	4.43	3.26	2.86	2.90	39.24
Davenport, Iowa.	1.72	1.95	2.41	3.01	4.83	5.72	4.20	3.22	3.47	3.12	2.22	1.89	38.70
Denver, Colo.	2.76	4.77	5.47	1.60	3.21	1.49	1.80	1.54	2.91	80	2.95	2.63	47.43
Detroit, Mich.	2.22	2.77	3.16	2.20	3.69	3.94	4.59	3.43	2.93	3.24	2.95	2.63	37.43
Dubuque, Iowa.	2.15	1.85	2.70	2.92	3.92	5.72	5.70	3.18	3.21	3.22	2.58	1.62	39.41
Durham, N. C.	2.15	2.75	3.45	2.96	4.13	5.05	3.49	3.22	4.60	3.21	2.88	1.64	34.02
El Paso, Tex.	3.15	3.78	3.45	3.06	4.29	4.39	4.96	3.52	2.74	4.18	1.86	3.61	48.03
Elrie, Pa.	3.23	3.13	3.12	3.57	3.97	5.37	3.12	4.23	4.31	4.18	4.51	3.23	42.39
Evansville, Mich.	1.45	1.39	1.80	1.95	3.52	3.67	3.04	3.51	4.70	3.12	4.97	3.29	36.40
Galveston, Tex.	2.74	2.43	2.04	3.16	4.16	2.89	4.79	4.46	3.63	3.03	3.23	2.47	37.13
Indianapolis, Ind.	2.96	3.01	4.07	3.43	4.66	2.35	2.60	4.46	7.12	7.08	3.01	2.63	54.63
Jacksonville, Fla.	1.94	2.00	2.40	1.67	2.77	4.08	2.15	7.37	4.08	2.63	2.25	1.70	43.34
Key West, Fla.	1.04	1.91	1.74	1.04	4.78	4.40	4.79	8.24	4.19	4.54	2.65	1.43	38.35
Knockville, Tenn.	1.94	1.91	1.91	1.94	4.33	4.08	4.08	4.19	4.08	4.08	2.65	1.43	43.34
La Crosse, Wis.	1.30	1.30	1.30	1.30	4.74	4.08	4.08	4.19	4.08	4.08	2.65	1.43	38.35
Lawrence, Kan.	1.30	1.30	1.30	1.30	4.74	4.08	4.08	4.19	4.08	4.08	2.65	1.43	38.35
Leavenworth, Kan.	1.30	1.30	1.30	1.30	4.74	4.08	4.08	4.19	4.08	4.08	2.65	1.43	38.35
Lexington, Va.	1.30	1.30	1.30	1.30	4.74	4.08	4.08	4.19	4.08	4.08	2.65	1.43	38.35

[illegible]

**Inappreciable.**



## APPENDIX 53.

Table showing the mean monthly and mean annual precipitation at selected stations of the Signal Service, United States Army, computed from January, 1879, to December, 1883, inclusive.

Stations.	Mean annual.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Albany, N. Y.	3.80	2.84	2.68	2.24	3.10	4.17	4.21	3.85	3.45	4.13	3.13	3.15
Alpena, Mich.	2.89	2.82	2.68	2.18	4.45	5.10	4.27	3.96	3.45	4.13	3.13	3.15
Apache, Fort, Ariz.	1.41	1.72	1.38	0.63	0.45	0.72	0.18	0.39	0.82	1.55	2.10	2.50
Atlanta, Ga.	7.51	6.92	4.65	5.83	5.99	2.45	2.88	4.21	3.22	2.81	1.97	1.81
Atlantic City, N. J.	4.55	4.92	4.05	5.43	5.14	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Augusta, Ga.	5.23	2.92	5.28	5.40	5.27	2.67	2.88	4.21	3.22	2.81	1.97	1.81
Baltimore, Md.	5.65	5.42	5.22	5.82	5.15	2.67	2.88	4.21	3.22	2.81	1.97	1.81
Barnegat City, N. J.	5.21	5.16	5.05	5.43	5.27	2.67	2.88	4.21	3.22	2.81	1.97	1.81
Bismarck, Dak.	0.32	0.54	0.66	0.43	0.77	0.34	0.54	0.57	0.77	1.10	2.49	4.14
Boston, Mass.	4.20	4.17	4.54	5.28	5.53	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Brownsville, Tex.	2.85	1.10	1.06	0.76	0.59	2.19	2.91	2.54	2.83	2.12	2.06	0.83
Buffalo, N. Y.	0.87	2.99	2.94	1.84	2.54	2.40	2.61	2.98	2.90	2.13	2.12	0.79
Bufford, Fort, Dak.	4.60	5.13	5.08	5.25	5.59	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Cairo, Ill.	4.73	5.39	5.09	5.17	5.79	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Cape Henry, Va.	4.94	5.09	5.09	5.00	5.12	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Cape May, N. J.	5.12	4.13	4.25	5.00	5.12	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Charleston, S. C.	5.79	4.30	4.96	5.00	5.04	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Charlotte, N. C.	5.84	5.07	5.26	5.53	5.53	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Chattanooga, Tenn.	0.83	0.16	0.35	0.53	0.82	1.87	1.81	1.87	0.81	0.85	0.19	0.18
Cheyenne, Wyo.	1.65	2.47	2.92	3.88	1.72	1.87	1.81	1.87	0.81	0.85	0.19	0.18
Chicago, Ill.	3.99	5.39	4.12	5.83	5.21	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Cincinnati, Ohio.	2.15	2.83	2.78	2.41	3.21	4.17	2.65	2.88	2.43	0.89	0.70	0.01
Cleveland, Ohio.	3.26	2.84	2.78	2.41	3.21	4.17	2.65	2.88	2.43	0.89	0.70	0.01
Columbus, Ohio.	1.80	2.84	2.78	2.41	3.21	4.17	2.65	2.88	2.43	0.89	0.70	0.01
Concho, Fort, Tex.	1.45	2.40	2.29	2.70	2.79	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Davenport, Iowa.	1.84	0.53	0.59	1.69	2.79	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Des Moines, Iowa.	1.06	1.99	1.40	2.95	3.54	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Detroit, Mich.	1.99	0.67	1.24	2.65	3.54	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Dodge City, Kans.	0.40	0.87	1.37	2.65	3.54	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Dubuque, Iowa.	1.84	1.19	1.87	2.65	3.54	2.65	2.88	4.21	3.22	2.81	1.97	1.81
Eastport, Me.	1.01	0.16	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
El Paso, Tex.	0.73	0.43	0.59	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
El Paso, Mich.	0.84	0.43	0.59	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Galveston, Tex.	0.84	0.43	0.59	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Great Falls, Mont.	0.84	0.43	0.59	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Indianapolis, Ind.	0.84	0.43	0.59	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

Indiana, Tex.	2.55	1.61	2.13	1.95	2.45	1.52	2.00	7.60	3.84	2.74	1.89	32.48
Jacksonville, Fla.	4.05	2.47	2.07	2.75	3.69	3.85	2.83	2.94	3.84	2.81	1.87	54.82
Key West, Fla.	1.44	2.54	2.07	3.18	4.30	3.94	3.00	2.72	3.80	2.91	1.91	54.82
Kitty Hawk, N. C.	2.06	1.90	2.03	2.11	2.91	3.98	3.19	2.70	3.83	2.83	1.97	63.87
Knoxville, Tenn.	2.83	4.83	4.43	5.04	2.91	3.41	4.69	3.58	3.28	4.43	4.63	63.87
La Crosse, Wis.	1.09	1.18	1.50	1.63	3.84	4.11	4.58	3.14	3.96	4.43	1.17	25.54
Los Angeles, Cal.	1.04	2.17	1.39	2.39	3.41	3.55	4.13	2.55	4.97	3.51	1.14	18.29
Louisville, Ky.	1.80	1.80	1.53	1.74	4.50	4.01	(1)	(1)	4.67	1.24	2.62	13.29
Lynchburg, Va.	4.04	6.03	4.47	4.94	2.03	3.70	2.97	3.98	4.01	4.05	4.96	49.53
Marquette, Mich.	4.23	2.55	3.56	3.05	4.08	3.19	3.47	2.95	3.65	2.13	4.61	86.94
Memphis, Tenn.	7.83	7.43	5.71	4.68	3.60	3.91	2.39	2.98	4.49	6.15	2.61	90.87
Montgomery, Ala.	1.45	2.69	2.81	1.90	5.57	4.01	4.17	2.10	2.66	2.70	1.48	57.00
Mount Washington, N. H.	5.33	5.56	5.39	5.78	3.50	3.99	3.54	2.85	4.00	2.94	6.19	90.87
Mt. Vernon, Tenn.	6.36	7.49	7.23	6.57	6.08	6.49	9.71	7.24	6.23	8.19	6.92	98.26
Nashville, Tenn.	4.15	4.68	5.61	5.18	4.56	3.11	5.53	4.81	4.63	4.63	4.74	58.78
New Haven, Conn.	4.76	4.92	5.13	3.83	3.51	5.76	4.77	3.70	4.24	2.88	3.51	48.14
New London, Conn.	5.94	6.64	3.24	7.90	5.83	5.40	7.06	4.24	4.24	5.08	4.74	61.08
New Orleans, La.	4.00	3.77	3.49	2.94	2.63	3.63	5.67	3.01	2.73	5.09	3.99	80.86
New York City.	4.31	2.95	3.87	4.21	2.89	3.40	3.69	3.69	3.24	2.91	3.63	47.95
Norfolk, Va.	0.84	0.55	0.41	1.00	3.48	4.98	3.40	5.36	1.97	0.23	0.60	21.69
North Platte, Nebr.	9.96	9.96	5.55	4.97	3.04	4.98	3.69	3.21	1.97	0.23	0.60	21.69
Olympia, Wash. T.	0.27	1.17	0.94	2.81	6.01	7.51	0.96	0.77	1.97	1.79	1.05	58.23
Omaha, Nebr.	2.89	3.71	3.13	2.36	4.05	4.02	3.70	2.92	2.61	4.13	5.20	87.06
Oswego, N. Y.	3.82	3.53	3.05	2.36	4.66	1.44	4.26	4.64	1.56	2.36	3.34	87.06
Philadelphia, Pa.	2.57	1.66	2.54	4.46	3.50	4.67	3.16	5.09	2.27	2.97	2.87	88.90
Pike's Peak, Colo.	3.18	3.18	3.06	2.19	3.19	4.78	4.26	2.94	2.97	3.07	2.73	88.90
Pittsburg, Pa.	2.20	2.79	3.20	2.30	2.96	3.95	3.53	2.04	2.99	3.17	2.87	88.90
Portland, Me.	3.78	4.20	3.30	2.21	2.96	3.95	3.16	3.78	2.99	3.17	2.87	88.90
Portland, Oreg.	8.98	9.02	5.50	4.33	2.92	1.62	0.59	1.70	3.78	3.17	2.87	88.90
Prescott, Ariz.	0.85	0.77	1.08	0.47	0.21	0.13	2.46	3.87	1.55	6.00	10.88	13.95
Roseburg, Oreg.	6.58	4.45	3.59	3.35	3.05	0.96	0.86	0.47	0.86	3.51	6.71	85.43
Sacramento, Cal.	3.02	2.85	2.69	4.23	1.05	0.15	2.43	(1)	1.01	1.56	4.01	81.23
Saint Louis, Mo.	1.94	4.62	1.53	3.13	3.74	3.96	4.87	2.98	2.45	4.13	1.93	80.18
Saint Paul, Minn.	1.31	1.51	1.63	1.81	3.74	3.96	0.13	2.98	2.45	1.66	1.65	14.23
Salt Lake City, Utah	1.27	1.06	0.97	2.96	1.15	0.84	0.03	0.07	0.70	1.65	1.67	9.57
San Diego, Cal.	2.06	3.77	4.61	3.88	0.28	0.60	0.03	0.01	0.70	0.75	2.64	48.11
Sandy Hook, N. J.	3.07	3.08	3.64	3.24	1.48	0.16	4.17	4.74	3.06	2.50	4.14	23.73
San Francisco, Cal.	3.61	2.09	2.80	3.84	1.48	0.16	4.17	4.74	3.06	2.50	4.14	23.73
Savannah, Ga.	3.71	2.09	2.80	3.84	1.48	0.16	4.17	4.74	3.06	2.50	4.14	23.73
Shreveport, La.	4.44	3.13	4.47	6.27	3.65	2.81	5.63	4.17	3.84	7.05	3.86	54.97
Smithville, N. C.	4.44	3.13	4.47	6.27	3.65	2.81	5.63	4.17	3.84	7.05	3.86	54.97
Stockton, N. C.	3.86	4.41	0.50	0.81	1.84	1.89	2.81	5.60	4.63	3.01	3.01	20.83
Toledo, Ohio	1.56	2.63	1.55	2.39	5.55	4.28	4.43	7.82	2.62	0.89	2.56	85.83
Vicksburg, Miss.	4.18	6.26	5.27	5.53	5.86	3.28	4.83	4.77	6.06	3.42	5.60	64.75
Washington City	4.20	2.55	4.19	2.98	2.86	4.68	3.39	4.00	1.91	1.71	4.01	41.27
Wilmington, N. C.	2.80	2.67	4.40	3.92	3.04	5.51	7.97	7.97	1.91	1.71	4.01	41.27
Yakaton, Dak.	0.64	0.51	1.04	2.38	6.06	4.63	4.93	2.00	2.34	0.35	0.04	23.24

\* Inappreciable.

## APPENDIX 54.

Monthly and annual precipitation reported by the voluntary observers of the Signal Service, United States Army, for the year ending June 30, 1884.

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Accotink, Va.	3.41	2.03	2.01	2.13	2.63	2.17	4.53	5.70	5.77	1.83	2.25	4.53
Alben, S. C.	(1)	(1)	(1)	(1)	3.48	1.61	2.58	3.08	7.16	4.40	2.15	(1)
Albany, Wash. T.	0.00	0.03	1.07	4.06	4.50	0.72	2.91	2.06	3.12	0.80	0.07	0.90
Albany, Oreg.	6.72	3.80	1.68	1.60	0.06	1.15	2.22	2.04	(1)	0.80	0.89	2.33
Alexandria, Dak.	(1)	(1)	(1)	(1)	0.00	1.52	0.22	0.66	2.81	1.00	0.04	2.34
Allison, Kans.	0.30	2.52	1.67	2.80	1.80	0.90	2.60	4.62	5.97	2.48	2.02	1.28
Ames, Iowa	3.69	1.57	3.17	4.31	0.26	3.10	(1)	2.15	7.52	4.17	1.27	(1)
Amherst, Mass.	3.06	1.88	3.18	7.21	0.85	3.14	2.01	5.38	4.05	3.80	4.98	7.44
Andersonville, Ga.	2.96	4.02	0.51	3.37	3.00	3.91	1.67	(1)	(1)	1.65	4.96	(1)
Andersonville, Tenn.	7.29	2.52	1.11	5.05	2.10	3.85	2.43	2.14	5.83	2.45	2.95	1.30
Anna, Ill.	5.55	0.95	2.85	1.30	0.75	0.21	(1)	(1)	(1)	4.72	1.66	(1)
Ann Arbor, Mich.	5.55	8.61	2.98	5.32	1.37	0.08	4.65	5.29	5.64	2.39	2.43	1.91
Archer, Fla.	3.97	2.68	2.68	6.34	2.61	3.08	3.65	3.29	5.94	2.39	3.06	(1)
Ardenia (Phillipstown), N. Y.	4.83	1.86	3.38	6.34	3.61	3.08	3.65	7.30	6.10	6.00	2.90	3.06
Ashland, N. H.	7.30	2.60	2.60	7.50	3.50	4.80	0.80	0.31	2.57	5.07	2.60	5.75
Ashwood, Tenn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.07	0.82	10.46
Atchison, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Athens, Ga.	(1)	(1)	(1)	2.01	1.85	5.47	3.38	4.20	(1)	(1)	(1)	(1)
Auburn, Ala.	(1)	(1)	(1)	(1)	1.85	5.47	3.38	4.20	(1)	(1)	(1)	(1)
Auburn, N. Y.	(1)	(1)	(1)	(1)	(1)	1.74	2.96	1.88	1.71	0.30	3.67	1.68
Austin, N. Y.	0.25	1.55	1.65	5.10	3.45	3.00	5.85	8.27	8.25	2.10	3.47	1.68
Austin, Tenn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	4.45	7.73	7.85	1.46
Bainbridge Island, Wash. T.	(1)	0.06	1.30	3.30	5.71	5.05	4.40	3.53	0.97	2.50	0.55	2.70
Bandon, Oreg.	(1)	(1)	1.00	7.25	0.02	5.75	0.31	4.37	1.12	7.00	0.33	1.22
Barnesville, Tex.	(1)	(1)	(1)	(1)	0.02	5.75	0.31	4.37	1.12	7.00	0.33	1.22
Battle Creek, Mich.	5.00	4.43	3.35	4.61	4.37	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Battle Creek, Tenn.	2.35	2.30	2.55	4.61	4.37	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Bay Pines, Fla.	4.00	2.30	2.55	4.61	4.37	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Belmont, N. H.	4.00	2.30	2.55	4.61	4.37	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Bellevue, W. Va.	4.00	2.30	2.55	4.61	4.37	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Benton, Ark.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bethel, N. Y.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bethel, Conn.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bethel, N. Y.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bethel, Conn.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Annual	41.82	41.82	41.82	41.82	41.82	41.82	41.82	41.82	41.82	41.82	41.82	41.82

Blooming Grove, Pa.	6.10	1.50	1.90	3.50	1.80	1.70	2.20	2.51	(1)	1.40	2.30	2.50
Bolivar, Tenn.	6.44	2.42	1.15	12.09	4.40	4.05	4.09	5.07	(1)	(1)	(1)	(1)
Bowling Green, Ky.	6.40	2.25	5.37	5.37	4.01	4.05	4.72	5.07	0.12	(1)	(1)	(1)
Brevard, N. C.	0.10	0.93	4.74	1.97	4.23	5.43	4.41	5.07	1.32	0.02	0.21	58.74
Bristol, N. H.	2.89	1.01	(1)	1.97	4.43	(1)	(1)	(1)	3.08	0.37	0.50	42.60
Brownsville, Tenn.	7.87	1.50	0.50	8.50	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Brunswick, Ga.	5.36	1.37	0.10	8.50	4.07	2.46	1.51	4.11	3.70	2.33	3.04	38.53
Bunker Hill, Ill.	2.37	1.76	(1)	5.55	1.59	3.44	2.14	2.63	1.90	1.90	1.84	(1)
Burlington, Vt.	(1)	(1)	(1)	5.23	1.59	3.54	5.54	6.51	4.85	3.20	4.56	48.84
Cadwell, N. J.	3.37	1.76	(1)	1.92	3.02	1.62	(1)	7.57	3.35	(1)	1.80	(1)
Canal Dover, Ohio.	(1)	(1)	(1)	(1)	6.01	(1)	(1)	(1)	0.64	(1)	(1)	(1)
Careyville, Tenn.	1.42	2.65	1.10	(1)	0.13	0.06	2.45	3.77	2.33	1.30	0.29	(1)
Carson City, Nev.	0.00	0.02	2.41	3.23	1.43	1.91	3.17	3.61	4.08	2.92	1.97	18.55
Cash Springs, S. A.	4.63	2.26	0.84	(1)	1.00	0.04	(1)	(1)	(1)	0.08	0.33	56.74
Cedar Rapids, Iowa	5.08	1.03	0.94	4.04	0.04	0.71	0.71	1.41	2.47	2.12	3.08	(1)
Chambersburg, Pa.	4.35	2.74	3.23	3.23	1.23	1.03	3.23	4.43	4.00	1.23	4.43	24.51
Channahon, Ill.	3.25	2.67	0.65	3.25	1.60	2.70	4.05	2.63	6.20	2.63	4.97	33.51
Charleston, Mass.	2.75	0.32	1.57	5.55	1.77	1.54	4.95	3.55	3.55	2.68	3.69	44.70
Charlotte, Vt.	5.40	(1)	3.90	2.80	2.35	2.03	7.74	5.85	4.25	2.90	4.40	(1)
Chesler, Minn.	(1)	(1)	(1)	(1)	3.10	(1)	3.60	4.90	0.43	2.83	2.70	(1)
Chickadee, Tenn.	(1)	(1)	3.45	(1)	(1)	(1)	(1)	(1)	(1)	(1)	4.75	(1)
Chickadee, Ohio (G. W. H.)	1.71	1.60	1.89	0.70	3.63	2.63	1.59	6.45	2.24	2.34	1.53	58.13
Chickadee, Tex.	5.31	1.32	1.42	11.42	0.95	0.62	2.49	10.33	2.98	(1)	0.57	(1)
Clay Center, Kans.	(1)	(1)	1.32	(1)	0.95	0.71	0.71	1.11	(1)	(1)	1.77	(1)
Clay Creek, Nebr.	(1)	5.16	(1)	4.99	0.23	0.54	0.50	0.89	2.44	3.64	3.23	(1)
Cleburn, Tex.	2.02	(1)	0.35	6.50	1.00	5.75	0.83	4.12	3.25	5.03	10.00	(1)
Cleveland, Ohio	4.25	2.45	4.35	3.73	2.00	2.61	2.43	5.01	2.43	1.91	3.00	36.64
Clinton, Ind.	(1)	(1)	(1)	(1)	2.32	(1)	(1)	(1)	(1)	(1)	10.04	(1)
Coalburn Harbor, British West Indies	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Coldwater, Mich.	(1)	(1)	1.70	3.50	(1)	1.00	(1)	(1)	(1)	0.26	(1)	(1)
College City, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	3.61	2.21	5.46	2.48	0.17	(1)
College Hill, Ohio	3.00	3.00	1.75	7.00	4.00	7.25	3.50	5.00	2.00	4.75	3.14	48.50
Collegeville, Ill.	2.30	0.82	0.40	5.60	4.23	1.02	0.82	4.46	2.83	3.44	2.73	53.99
Comfort, Tex.	4.10	0.00	0.98	1.64	0.65	2.18	0.18	(1)	(1)	(1)	(1)	(1)
Conception, Mo.	(1)	0.00	(1)	(1)	0.31	0.65	0.43	0.43	2.41	2.44	3.02	(1)
Conzocook, N. H.	(1)	1.00	(1)	(1)	1.85	2.10	4.15	5.00	4.20	(1)	1.05	(1)
Conway, Kans.	(1)	2.76	1.95	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87.82	(1)
Coopersburg, N. Y.	4.77	3.21	2.45	2.96	1.76	1.68	3.17	3.16	4.33	1.38	3.97	(1)
Corryville, N. Y.	6.31	1.05	2.45	3.89	2.53	2.74	2.74	7.23	4.51	(1)	4.83	(1)
Corryville, Tenn.	3.34	1.05	1.20	3.04	2.00	1.27	0.88	(1)	2.71	2.44	4.47	53.73
Cresco, Iowa	12.70	1.51	4.43	1.50	1.17	0.80	0.41	0.41	1.04	3.02	1.79	3.33
Cumtula, Md.	4.05	1.46	2.59	5.83	0.97	1.75	1.85	3.64	1.96	5.83	3.33	84.06
Curryville, Mo.	(1)	(1)	1.84	(1)	1.73	0.91	0.92	(1)	2.69	(1)	(1)	(1)
Danvers, N. Y.	(1)	(1)	(1)	5.83	(1)	(1)	(1)	(1)	0.53	0.62	0.62	(1)
Danvers, N. Y.	(1)	(1)	2.59	2.09	0.53	0.87	0.65	1.23	2.39	1.81	3.99	37.70
De Soto, Nebr.	2.60	4.05	2.64	3.05	0.23	0.87	5.28	7.19	7.00	2.87	1.90	48.82
Distributing Reservoir, District Columbia	(1)	3.55	4.05	3.00	2.31	2.61	2.61	5.17	4.04	3.94	3.94	(1)
Durand, Vt.	(1)	(1)	(1)	(1)	1.54	1.95	4.30	(1)	4.04	2.40	2.65	(1)
Drifton, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	4.30	(1)	4.04	2.40	2.65	(1)

\* Inappropriate.

† No record.



Gardner, Mo	3.49	6.33	8.11	4.48	2.04	3.07	5.40	7.29	5.40	6.53	4.00	1.22	47.86
Garrettsville, Ohio	(1)	(1)	(1)	(1)	(1)	(1)	5.45	(1)	5.40	1.53	1.75	(1)	
Gauda Springs, Kans	(1)	3.70	(1)	(1)	(1)	(1)	0.70	(1)	4.17	(1)	(1)	(1)	
Genoa, Neb	(1)	1.75	1.75	3.25	(1)	(1)	(1)	1.30	2.75	2.05	2.47	(1)	
Germanstown, Pa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.95	4.18	(1)	(1)	(1)	
Golden, Colo	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	5.05	2.02	(1)	(1)	
Grand Canyon, Pa	4.31	1.44	5.43	4.98	2.31	3.05	3.29	(1)	5.05	6.85	(1)	(1)	
Grand Rapids, Mich	6.05	1.65	2.24	2.89	2.55	4.76	8.83	4.69	10.30	5.03	14.08	(1)	47.53
Grand Rapids, Colo	1.97	0.43	0.97	2.69	5.71	4.76	(1)	2.50	10.30	6.02	61.25	(1)	
Grand Turk Island, B. W. I.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.98	1.74	(1)	(1)	
Grand View, Tenn	1.30	0.49	4.72	2.34	6.74	0.67	1.10	0.80	2.98	1.22	2.38	(1)	25.64
Grassy Cove, Tenn	1.20	2.04	1.39	3.70	5.90	(1)	(1)	(1)	2.53	0.04	2.34	(1)	
Great Falls Reservoir, Md	2.10	4.72	2.06	3.16	2.88	1.67	5.10	5.75	2.19	1.96	(1)	(1)	
Greenville, Tenn	1.56	1.53	1.91	2.16	0.54	(1)	(1)	(1)	(1)	(1)	5.80	(1)	37.05
Greenville, Tenn	2.30	(1)	1.24	4.10	2.10	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Greenville, Ind	3.15	(1)	0.68	2.30	4.53	5.09	7.67	6.43	9.17	5.19	(1)	(1)	60.18
Grief, Tenn	2.57	6.35	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Grief, Tenn	1.51	(1)	1.73	7.88	5.94	5.12	1.63	(1)	2.54	2.73	(1)	(1)	
Griffin, Ind	3.65	(1)	2.36	1.69	1.30	1.65	0.76	1.79	1.37	1.00	2.80	(1)	31.80
Guttenberg, Iowa	10.01	1.25	(1)	4.10	0.90	2.00	(1)	(1)	1.37	(1)	(1)	(1)	
Hampton, Va	2.10	4.74	(1)	5.35	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Harrison's Mills, Tenn	(1)	0.76	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Hartsville, Mich	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Hartford Conn	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Haverford College, Pa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Hector, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Hector, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Helysia, W. Va	7.54	1.73	3.09	3.25	1.50	0.75	2.20	0.60	4.93	2.47	3.33	(1)	54.17
Hillside, N. C	1.10	1.13	3.09	5.21	2.05	5.15	6.00	5.24	4.96	2.70	4.51	(1)	63.24
Hillsdale, Mich	5.25	1.77	1.82	2.15	5.50	5.05	3.60	10.10	13.55	5.40	2.45	(1)	37.70
Hiram, Ohio	(1)	(1)	(1)	4.22	3.66	1.87	1.11	4.86	2.48	1.70	4.13	(1)	
Hilton, Kans	5.37	2.63	0.88	9.38	0.37	0.50	5.14	(1)	5.28	1.82	(1)	(1)	
Honey Grove, Tex	(1)	(1)	(1)	(1)	(1)	(1)	1.12	0.87	4.75	(1)	(1)	(1)	
Howell, Tenn	1.73	2.37	3.32	3.98	4.96	(1)	(1)	(1)	(1)	2.40	0.80	(1)	
Hudson, Mich	(1)	(1)	(1)	(1)	4.00	2.13	2.85	3.42	(1)	(1)	(1)	(1)	
Hulmeville, Pa	(1)	5.28	5.05	4.27	(1)	1.70	3.15	5.60	(1)	(1)	4.58	(1)	3.61
Humphrey, Iowa	6.13	2.26	2.22	1.96	1.45	(1)	0.20	1.19	3.04	3.37	1.80	(1)	4.87
Humphrey, N. Y	6.69	2.55	2.85	3.33	3.02	1.70	2.14	3.62	2.14	2.14	2.62	(1)	22.53
Hydesville, Cal	(1)	(1)	(1)	(1)	1.68	5.14	4.43	4.30	7.03	6.28	0.50	(1)	
Inavale, Neb	(1)	(1)	2.00	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Independence, Iowa	7.53	2.25	2.55	3.40	2.45	2.75	1.35	1.70	3.15	1.68	2.70	(1)	37.05
Independence, Kans	4.53	0.27	0.27	7.16	0.79	1.66	0.68	2.23	1.00	4.88	1.27	(1)	27.26
Indianola, Iowa	3.25	0.67	1.35	4.87	2.80	1.10	0.38	1.98	2.50	1.83	3.56	(1)	30.59
Ionia, Mich	7.44	2.07	3.00	3.28	3.76	1.37	2.24	3.37	3.51	2.16	2.81	(1)	35.84
Ithaca, N. Y	2.50	2.57	3.57	2.55	1.50	1.15	2.13	2.64	3.41	1.88	4.36	(1)	32.36
Jacksonburg, Ohio	2.50	2.55	2.81	6.50	3.50	2.75	2.60	7.65	3.00	1.55	4.85	(1)	1.85
Jeffersonville, Ind	6.71	2.39	0.84	0.84	7.80	5.03	(1)	8.81	3.00	2.30	4.94	(1)	4.06
Johanna Maria, S. A	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Johnson, Neb	4.45	1.35	1.35	4.15	0.50	0.26	0.50	1.01	2.71	2.80	(1)	(1)	

1 No record.

2 Inappreciable.

Monthly and annual precipitation reported by the voluntary observers of the Signal Service, &amp;c.—Continued.

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Johnstown, Va.	5.10	5.15	5.90	4.70	0.60	2.55	0.55	0.55	8.75	1.70	1.05	1.05
Johnstown, N. Y.	2.51	1.52	4.68	1.76	3.56	2.64	0.55	0.55	8.75	1.70	1.05	1.05
Kalamazoo, Mich.	4.14	0.42	( )	2.97	( )	( )	4.32	4.32	( )	2.11	3.98	4.86
Kansas City, Mo.	( )	( )	( )	( )	( )	( )	1.20	( )	( )	0.78	12.06	7.64
Kew, B. W. I.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Kiantone, N. Y.	8.34	1.45	( )	3.88	3.13	( )	( )	( )	( )	( )	( )	( )
Kingston Springs, Tenn.	5.10	5.20	0.98	0.21	( )	4.09	3.19	9.19	5.05	2.46	4.07	4.73
Laconia, Ind.	2.46	2.20	0.56	5.31	5.22	2.38	1.09	5.08	1.87	2.79	3.31	4.13
Lafayette, Ind.	4.68	1.77	1.46	5.56	3.09	2.38	1.09	5.08	1.87	2.79	3.31	4.13
Lake Village, N. H.	4.61	1.22	3.02	4.75	2.61	3.19	4.16	5.02	5.81	2.22	3.38	4.82
Lancaster, Wis.	10.12	0.21	3.37	3.64	4.08	0.93	1.92	3.24	3.71	2.12	4.34	3.09
Lansing, Mich.	( )	( )	( )	( )	2.72	1.26	1.52	1.52	2.02	2.32	( )	( )
Larchland, Ill.	( )	2.12	1.25	6.75	0.73	0.77	1.28	1.13	2.73	3.03	3.57	3.51
Lawrence, Kans.	11.60	4.79	1.52	18.11	5.77	4.53	2.05	10.93	3.95	2.36	3.57	3.57
Lead Hill, Ark.	4.62	3.11	3.74	2.73	2.24	3.40	5.33	5.11	3.97	1.50	5.29	43.70
Lebanon, Ohio	3.70	6.00	0.50	4.60	8.40	1.50	3.80	4.90	9.40	4.50	2.40	10.30
Leedsdale, Pa.	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Lenoir, N. C.	4.76	( )	( )	( )	( )	( )	( )	( )	( )	3.20	3.43	9.45
Levi, Kans.	2.20	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
Limona, Fla.	1.83	11.25	0.68	2.25	( )	( )	0.38	0.71	2.15	( )	( )	( )
Lincoln, Nebr.	1.96	3.08	0.83	4.25	( )	0.25	( )	( )	( )	( )	( )	( )
Litchfield, Mich.	3.63	4.42	2.13	3.28	3.30	( )	( )	( )	( )	( )	( )	( )
Livingston, Tenn.	3.63	4.42	2.13	3.28	3.30	( )	( )	( )	( )	( )	( )	( )
Logan, Iowa	5.57	5.00	4.10	2.50	0.10	1.10	1.80	1.50	1.70	3.10	2.10	3.40
Logansport, Ind.	5.57	2.61	3.14	5.29	3.46	2.09	1.80	2.30	1.50	2.19	3.42	4.25
Louisa, Va.	3.99	1.18	2.90	3.80	2.08	1.00	3.20	2.30	1.50	0.86	4.25	4.25
Lunenburg, Vt.	3.99	1.18	2.90	3.80	2.08	1.00	3.20	2.30	1.50	0.86	4.25	4.25
Madison, Wis.	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Maquoket, Iowa	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Manchester, Tenn.	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Manchester, Kans.	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Manhattan, Kans.	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Manitowish, Wis.	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Manitowish, Wis.	4.21	0.83	2.04	2.90	2.14	1.95	1.38	1.38	2.81	4.51	4.21	3.99
Margaretta Township, Ohio	13.68	1.06	2.96	1.88	2.41	0.96	0.34	4.47	0.84	3.23	1.76	0.97
Margaretta, Ohio	5.00	4.80	2.13	3.20	3.73	2.05	1.18	4.07	1.59	2.43	2.43	2.16
Marquette, Nebr.	2.80	2.13	0.59	2.35	2.13	2.05	1.18	4.07	1.59	2.43	2.43	2.16
Marquette, Nebr.	2.80	2.13	0.59	2.35	2.13	2.05	1.18	4.07	1.59	2.43	2.43	2.16
Marshall, Mich.	2.80	2.13	0.59	2.35	2.13	2.05	1.18	4.07	1.59	2.43	2.43	2.16

Maryville, Tenn.....	2.95	3.77	3.56	3.47	4.45	(1)	2.26	(1)	5.44	(1)	2.75	(1)	4.10	(1)	5.00	(1)	48.78
Mayport, Fla.....	4.06	1.78	(1)	(1)	(1)	4.78	(1)	2.36	(1)	3.02	(1)	3.06	(1)	2.45	(1)	7.28	(1)
Maud, Kans.....	2.08	4.78	5.86	3.17	(1)	0.64	0.44	0.44	3.53	(1)	8.06	(1)	1.88	(1)	4.41	(1)	43.65
Mayport, Fla.....	4.55	7.82	7.29	2.81	(1)	1.00	1.06	1.06	8.88	(1)	5.24	(1)	1.88	(1)	3.18	(1)	
Mazatlan, Mexico...	2.92	2.93	4.19	2.85	(1)	2.27	2.97	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
McDonough, Md.....	4.77	1.93	9.34	5.18	(1)	3.20	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
McKenzie, Tenn.....	2.29	3.68	(1)	4.86	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
McMinville, Tenn.....	1.05	3.17	(1)	3.29	(1)	0.97	0.99	0.99	0.95	(1)	1.75	(1)	1.67	(1)	2.89	(1)	31.84
Mcnead Station, near Albany, N. Y.....	6.78	2.09	(1)	2.80	(1)	2.80	(1)	(1)	(1)	(1)	(1)	(1)	1.97	(1)	5.39	(1)	
Mendon, Mass.....	2.25	0.90	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Mendon, Mich.....	(1)	4.55	1.25	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Milan, Kans.....	5.56	4.28	3.70	4.72	4.45	4.45	3.85	3.85	4.45	(1)	7.96	(1)	4.49	(1)	4.98	(1)	54.81
Milan, Tenn.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	4.51	(1)	1.69	(1)	
Millidgeville, Ga.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	5.55	(1)	4.98	(1)	
Millville Depot, Pa.....	2.78	0.76	1.73	6.30	2.44	0.68	2.38	2.38	0.72	5.46	4.70	4.21	4.21	(1)	3.01	(1)	43.71
Milton, Mass.....	4.83	4.47	1.03	1.17	0.68	1.03	0.72	0.72	0.72	0.22	0.95	(1)	1.73	(1)	2.99	(1)	47.15
Minneapolis, Minn.....	10.85	1.22	1.45	4.33	1.35	1.35	1.27	1.27	0.61	1.15	3.90	(1)	1.86	(1)	3.79	(1)	21.86
Monticello, Iowa.....	1.97	1.07	4.77	5.22	1.48	4.32	3.23	3.23	4.32	5.33	4.64	(1)	1.65	(1)	3.74	(1)	34.93
Moorestown, N. J.....	5.17	2.17	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.84	(1)	43.15
Morrison, Ill.....	6.80	2.30	1.90	(1)	4.30	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.60	(1)	2.40	(1)	
Morrison, Dak.....	(1)	2.90	1.50	(1)	(1)	(1)	1.78	1.78	1.12	3.24	3.58	(1)	1.58	(1)	27.16	(1)	
Mottville, Mich.....	5.39	2.91	2.27	4.88	1.14	1.14	2.72	2.72	5.84	4.40	3.96	(1)	2.43	(1)	2.72	(1)	
Mountainville, N. Y.....	(1)	(1)	1.60	(1)	1.75	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.94	(1)	4.88	(1)	
Mount Forest, Canada	2.10	5.80	(1)	7.85	2.15	2.15	5.05	5.05	2.30	9.90	4.90	(1)	8.30	(1)	10.25	(1)	63.35
Mount Ida, Ark.....	2.84	1.45	(1)	6.28	3.45	3.45	1.45	1.45	1.05	1.40	2.88	(1)	2.08	(1)	5.57	(1)	36.40
Murfreeborough, Tenn.....	8.97	1.45	(1)	(1)	0.64	0.40	0.40	0.40	0.46	0.82	0.79	(1)	1.80	(1)	3.30	(1)	
Muscataine, Iowa.....	2.40	5.10	(1)	1.50	1.20	1.20	0.80	0.80	0.46	3.70	2.15	(1)	6.30	(1)	2.70	(1)	24.41
Nebraska City, Nebr.....	1.40	0.70	0.15	2.25	1.70	(1)	2.00	2.00	0.86	(1)	(1)	(1)	2.92	(1)	(1)	(1)	
Neillsville, Wis.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Nephi, Utah.....	(1)	0.82	2.82	6.31	3.24	3.24	3.79	3.79	4.70	5.87	(1)	(1)	(1)	(1)	3.37	(1)	
Newark, N. J.....	6.92	(1)	(1)	2.97	2.97	2.97	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
New Bedford, Mass.....	7.29	(1)	(1)	0.00	0.02	0.02	1.14	1.14	4.77	4.25	5.92	(1)	4.17	(1)	6.79	(1)	
New Market, N. H.....	(1)	2.65	4.48	3.64	2.02	2.02	2.21	2.21	3.55	4.03	3.61	(1)	2.56	(1)	2.81	(1)	
Newport, Fla.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
Newport, Vt.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
New Tacoma, Wash., T.....	(1)	2.10	7.71	3.51	5.32	5.32	2.61	2.61	3.43	2.58	4.86	(1)	4.68	(1)	15.25	(1)	56.18
New Union, Tex.....	2.00	1.20	3.80	0.60	1.20	1.20	1.50	1.50	0.75	(1)	(1)	(1)	2.02	(1)	2.56	(1)	
Nora Springs, Iowa.....	6.73	2.72	0.92	1.08	1.00	1.00	1.61	1.61	1.90	1.83	1.17	(1)	1.75	(1)	2.56	(1)	27.54
Northfield, Minn.....	2.90	1.50	2.65	5.00	4.40	4.40	3.30	3.30	1.90	4.55	3.10	(1)	1.75	(1)	1.90	(1)	34.90
North Lewisburg, Ohio.....	7.60	4.00	3.35	6.95	7.85	7.85	2.92	2.92	4.00	2.15	4.58	(1)	16.50	(1)	19.85	(1)	83.85
Northport, Mich.....	3.95	1.50	2.55	2.35	4.00	4.00	2.85	2.85	3.70	3.25	3.90	(1)	0.80	(1)	0.50	(1)	
North Volney, N. Y.....	0.00	(1)	1.00	1.03	0.90	(1)	(1)	(1)	3.81	5.25	6.59	(1)	0.55	(1)	3.03	(1)	
Oakland, Cal.....	0.00	0.00	0.00	2.96	0.00	(1)	3.32	3.32	(1)	4.44	6.85	(1)	3.38	(1)	5.42	(1)	47.20
Oakwood, Cal.....	6.90	0.53	2.23	4.97	3.75	(1)	2.96	2.96	0.72	(1)	(1)	(1)	3.38	(1)	5.42	(1)	
Orono, Me.....	(1)	(1)	(1)	(1)	(1)	(1)	4.50	4.50	(1)	1.11	3.45	(1)	3.51	(1)	4.00	(1)	
Oskaloosa, Iowa.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.68	(1)	1.48	(1)	
Ottumwa, Iowa.....	3.17	1.29	1.83	1.80	3.57	(1)	2.63	2.63	5.05	3.60	3.23	(1)	5.05	(1)	4.00	(1)	4.91
Palermo, N. Y.....	10.73	2.70	2.83	1.64	6.14	(1)	4.82	4.82	6.50	(1)	(1)	(1)	15.38	(1)	15.38	(1)	28.60
Parimaribo, Dutch Guiana, South America.....																	

\* Inappreciable.

1 No record.



Monthly and annual precipitation reported by the voluntary observers of the Signal Service, &c.—Continued.

Stations.	1893.						1894.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Paris, Tenn.	4.90	2.00	0.73	1.00	0.97	1.59	1.16	1.74	1.20	2.40	4.47	1.00
Paterson, N. J.	2.93	1.80	5.41	4.38	0.97	1.63	2.28	5.15	2.63	2.40	4.47	1.00
Penn Yan, N. Y.	2.83	4.80	2.27	2.57	4.19	1.87	0.70	2.18	2.17	2.63	2.78	2.83
Peoria, Ill.	3.44	0.57	0.25	5.46	0.50	1.00	0.40	1.00	2.30	2.07	1.15	5.84
Perr, Nebr.	2.57	2.50	0.25	5.46	0.50	1.00	0.40	1.00	2.30	2.07	1.15	5.84
Phillipsburg, N. J.	4.92	1.44	0.20	8.00	2.88	1.81	3.88	4.88	3.47	2.07	3.78	2.78
Pierce City, Mo.	0.80	4.80	0.20	8.00	2.88	2.80	0.90	4.70	1.30	5.60	4.10	4.20
Plant Waterloo, South America.	10.60	3.97	0.43	0.42	4.70	7.15	0.90	4.70	0.62	1.26	0.17	0.47
Pleasant Grove, Wash.	0.00	0.00	0.22	0.45	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Point Lobos, Cal.	0.00	0.00	0.22	0.45	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Point Pleasant, La.	1.79	0.00	1.00	5.42	4.08	1.56	1.45	2.43	2.17	0.00	2.77	0.80
Polo, Ill.	5.04	1.33	2.53	4.09	1.12	1.81	3.03	4.39	4.45	2.29	2.75	2.12
Portsmouth, Ohio	4.18	6.22	1.46	4.47	2.08	2.36	5.24	6.11	5.55	3.90	4.89	2.47
Poway, Cal.	0.00	0.00	0.00	1.59	0.00	2.40	1.59	0.11	5.96	1.81	2.26	0.44
Prairie du Chien, Wis.	0.00	0.00	0.00	1.59	0.00	2.40	1.59	0.11	5.96	1.81	2.26	0.44
Pretty Prairie, Kans.	4.12	3.97	3.35	6.38	0.50	0.90	0.12	0.89	1.96	4.97	2.42	2.10
Princeton, Cal.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Princeton, Mass.	2.48	0.51	1.43	5.92	1.72	3.01	7.56	7.44	6.91	5.75	3.29	2.45
Princeton, N. J.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Providence, R. I.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Pueblo, Colo.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Puerto de Luna, N. Mex.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Pulaski, Tenn.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Quaker City, Ohio	7.23	2.25	1.83	2.92	4.80	0.54	0.57	0.72	0.05	2.53	2.04	4.81
Quakertown, Pa.	1.05	2.25	2.73	4.10	1.47	2.15	2.96	4.74	4.99	2.70	1.20	1.07
Quitman, Ga.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Raleigh, N. C.	8.11	1.44	2.00	1.85	1.79	1.66	1.30	0.94	4.12	2.40	2.40	2.80
Rapid City, Dak.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Readington, N. J.	2.45	2.00	2.30	4.90	1.50	1.66	1.30	0.94	4.12	2.40	2.40	2.80
Red Willow, Nebr.	2.97	2.05	2.15	2.92	0.02	2.33	0.98	0.63	4.69	2.67	2.70	2.12
Richardson, Ark.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Richmond, Ky.	0.00	0.00	0.58	0.64	0.10	0.14	0.03	2.85	5.06	2.71	0.05	2.12
Shelby, Tenn.	2.05	2.23	1.90	2.92	0.00	2.33	0.98	0.63	4.69	2.67	2.70	2.12
Shelby, Ill.	2.04	1.17	2.04	2.92	0.00	2.33	0.98	0.63	4.69	2.67	2.70	2.12
Annual.	49.10	49.10	49.10	49.10	49.10	49.10	49.10	49.10	49.10	49.10	49.10	49.10

Ripon, W. Va.	12.59	1.41	2.46	0.80	2.54	1.09	(1)	5.85	2.15	2.26	0.75	2.03	.....
Rising Sun, Ind.	2.45	2.55	1.50	4.45	(1)	3.35	2.65	5.85	(1)	3.45	(1)	2.00	41.47
Rockford, Ill.	3.09	1.60	4.92	0.66	(1)	1.58	1.48	1.91	(1)	(1)	(1)	6.16	.....
Rockville, Tenn.	3.15	1.61	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
Rolling Green, Kans.	4.40	2.15	3.25	0.25	1.82	2.60	3.37	5.10	4.65	1.35	2.15	1.45	40.79
Ross, Mass.	5.30	3.05	7.70	2.05	1.80	(1)	3.18	3.75	7.63	0.35	2.00	1.57	.....
Ruggles, Ohio	5.35	1.40	(1)	(1)	(1)	(1)	(1)	4.10	(1)	4.30	0.09	(1)	.....
Sacramento, Cal.	0.00	0.00	(1)	2.42	4.83	(1)	(1)	9.65	12.20	(1)	(1)	(1)	.....
Sailors' Rest, Tenn.	2.68	1.35	4.50	(1)	(1)	3.45	2.45	(1)	8.63	3.02	2.49	(1)	.....
Saint George's, Del.	(1)	(1)	2.06	(1)	(1)	(1)	(1)	(1)	(1)	3.00	1.32	2.49	.....
Saint Louis, Mo.	(1)	(1)	1.04	8.08	0.04	0.09	0.02	0.05	1.09	3.05	0.77	3.49	.....
Salem, N. J.	4.05	1.01	0.19	1.19	0.25	0.90	1.70	4.40	5.00	3.05	2.72	5.09	24.72
Salina, Kans.	(1)	0.53	1.45	1.57	4.88	2.33	0.83	0.53	2.06	0.24	1.01	1.23	.....
Salt Cay, B. W. I.	(1)	0.53	1.45	1.57	4.88	2.33	0.83	0.53	2.06	0.24	1.01	1.23	.....
Sandwich, Ill.	(1)	4.14	0.00	3.77	1.08	2.64	2.68	3.48	5.94	1.67	2.08	3.24	42.88
Sandy Springs, Md.	3.00	4.14	0.00	3.77	1.08	2.64	2.68	3.48	5.94	1.67	2.08	3.24	.....
Santa Barbara, Cal.	4.31	2.03	1.75	7.27	4.22	(1)	(1)	(1)	0.45	0.38	7.34	3.79	.....
Savannah, Tenn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
Shellock, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
Smithville, Tenn.	2.60	3.30	1.20	2.80	5.10	(1)	(1)	(1)	(1)	0.38	7.34	3.79	.....
Snowville, Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
Somerset, Mass.	3.81	0.53	2.51	4.34	3.20	3.05	0.00	4.12	4.91	4.33	2.20	7.30	44.89
South Haven, Kans.	2.19	3.35	4.31	4.23	0.99	4.24	4.68	4.68	3.73	2.12	2.88	6.20	44.09
Southington, Conn.	7.37	2.30	2.75	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
South Orange, N. J.	2.68	1.96	2.75	4.47	1.11	2.70	4.18	4.76	3.49	3.05	2.48	2.06	46.34
Spiceoland, Ind.	2.23	2.50	4.30	5.00	0.95	4.06	0.00	4.85	4.28	2.35	3.30	2.11	.....
Springfield, Ark.	3.80	6.35	(1)	(1)	(1)	(1)	(1)	10.15	(1)	4.39	4.28	2.06	.....
Springfield, Mo.	(1)	(1)	(1)	(1)	(1)	3.42	4.15	(1)	(1)	(1)	4.48	2.67	41.00
Stateburg, S. C.	2.18	2.41	6.11	3.38	2.22	1.26	4.43	3.29	3.53	3.66	3.97	4.91	.....
State College, Pa.	(1)	(1)	(1)	(1)	(1)	2.12	2.27	3.56	4.29	1.73	2.87	1.07	.....
Stateville, N. C.	2.70	1.35	1.85	(1)	1.49	(1)	0.06	(1)	12.03	4.40	2.68	7.99	.....
Station Albina, South America.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
Stella, Neb.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
Stockham, Neb.	(1)	(1)	(1)	(1)	(1)	0.35	0.28	0.44	0.90	5.00	4.10	1.10	39.95
Stratford, Va.	3.25	7.13	1.75	4.25	0.00	0.55	0.80	0.70	5.20	2.10	4.52	2.80	.....
Sunman, Ind.	6.00	2.40	3.60	2.60	1.70	2.50	3.00	4.70	5.20	2.40	3.82	1.60	.....
Sussex, Wis.	8.78	4.95	2.95	5.75	3.77	4.04	2.00	7.48	1.91	3.61	3.11	3.70	48.57
Swanwick, Ill.	5.24	0.43	0.09	2.87	1.92	1.36	1.15	0.18	2.75	2.12	4.04	5.06	.....
Swarts Creek, Mich.	(1)	3.23	0.08	3.38	5.90	0.61	1.09	3.00	2.99	2.07	3.17	4.50	.....
Sycamore, Ill.	(1)	(1)	(1)	(1)	(1)	(1)	0.71	2.15	2.02	4.06	3.18	4.58	.....
Table Rock, Neb.	(1)	(1)	(1)	(1)	(1)	0.24	2.78	(1)	(1)	3.29	4.35	3.74	.....
Tamaqua, Pa.	2.84	1.40	0.71	4.25	0.40	(1)	(1)	(1)	(1)	3.29	4.35	3.74	.....
Taunton, Mass.	3.75	0.38	2.30	4.34	6.53	1.31	4.35	5.12	5.33	2.30	2.73	4.04	.....
Terre Haute, Ind. (H.)	(1)	(1)	0.78	10.88	6.53	1.31	4.35	5.12	5.33	2.30	2.73	4.04	.....
The Dalles, Oreg.	0.00	0.01	0.01	0.46	2.19	1.77	(1)	4.08	3.37	1.97	(1)	2.76	.....
Thornville, Mich.	6.53	0.98	2.13	2.94	1.84	1.51	1.77	4.08	3.37	1.97	(1)	2.76	.....
Topeka, Kans.	6.53	4.17	2.76	6.14	0.81	(1)	0.65	2.88	2.19	4.33	3.51	5.18	.....
Traverse City, Mich.	6.53	4.17	2.76	6.14	0.81	(1)	0.65	2.88	2.19	4.33	3.51	5.18	.....
.....	.....	.....	.....	2.48	4.71	2.78	2.19	3.07	2.29	2.13	2.11	2.79	37.00

\* Inappreciable.

1 No record.

Monthly and annual precipitation reported by the voluntary observers of the Signal Service, &c.—Continued.

Stations.	1883.							1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Annual.
Trenton, Tenn.	Inches. (1)	4.57 (1)	0.96 (1)	12.83 (1)	5.80 (1)	Inches. (1)	Inches. (1)	Inches. (1)	3.85 (1)	2.88 (1)	Inches. (1)	Inches. (1)	Inches. (1)
Troy, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	4.32 (1)	4.25 (1)	3.85 (1)	2.88 (1)	4.19 (1)	2.63 (1)	2.63
Tucson, Ariz.	(1)	1.64 (1)	(1)	3.12 (1)	(1)	(1)	(1)	(1)	(1)	(1)	0.28 (1)	0.23 (1)	0.23
Utica, N. Y.	2.77 (1)	2.28 (1)	4.98 (1)	8.79 (1)	1.06 (1)	0.40 (1)	4.49 (1)	7.12 (1)	8.78 (1)	2.21 (1)	2.04 (1)	5.33 (1)	46.88
Variety Mills, Va.	(1)	(1)	1.30 (1)	1.57 (1)	5.73 (1)	5.85 (1)	3.02 (1)	10.23 (1)	1.50 (1)	2.43 (1)	1.68 (1)	4.20 (1)	56.60
Vermilion, Dak.	4.83 (1)	2.27 (1)	4.27 (1)	7.67 (1)	2.28 (1)	4.45 (1)	5.26 (1)	6.78 (1)	1.37 (1)	1.99 (1)	5.17 (1)	1.97 (1)	56.60
Vevay, Ind.	(1)	(1)	(1)	6.89 (1)	1.87 (1)	5.16 (1)	11.56 (1)	6.78 (1)	3.59 (1)	3.33 (1)	1.99 (1)	1.97 (1)	56.60
Vinceland, N. J. (F. T. Hill)	3.52 (1)	2.00 (1)	4.98 (1)	7.06 (1)	1.87 (1)	5.16 (1)	11.56 (1)	6.78 (1)	3.59 (1)	3.33 (1)	1.99 (1)	1.97 (1)	56.60
Virginia A. & M. College, Va.	(1)	(1)	(1)	6.70 (1)	2.47 (1)	3.18 (1)	5.80 (1)	6.30 (1)	4.25 (1)	2.45 (1)	1.58 (1)	6.24 (1)	56.60
Voluntown, Conn.	(1)	1.05 (1)	2.80 (1)	5.70 (1)	2.47 (1)	3.18 (1)	5.80 (1)	6.30 (1)	4.25 (1)	2.45 (1)	1.58 (1)	6.24 (1)	56.60
Wabash, Ind.	5.09 (1)	2.11 (1)	3.37 (1)	7.37 (1)	3.45 (1)	2.87 (1)	1.29 (1)	4.48 (1)	2.05 (1)	2.84 (1)	4.09 (1)	2.23 (1)	40.84
Washington, D. C.	3.80 (1)	2.80 (1)	3.84 (1)	2.57 (1)	1.02 (1)	2.79 (1)	5.02 (1)	6.15 (1)	5.60 (1)	1.59 (1)	2.84 (1)	6.17 (1)	44.59
Wausau, Wis.	(1)	(1)	(1)	(1)	(1)	(1)	1.98 (1)	5.02 (1)	2.78 (1)	2.41 (1)	1.91 (1)	4.03 (1)	38.03
Wauson, Ohio	6.44 (1)	1.67 (1)	2.96 (1)	4.37 (1)	2.88 (1)	2.41 (1)	1.98 (1)	5.02 (1)	2.78 (1)	2.41 (1)	1.91 (1)	4.03 (1)	38.03
Waverly, Tenn.	5.08 (1)	3.07 (1)	2.00 (1)	5.04 (1)	3.03 (1)	(1)	(1)	(1)	5.10 (1)	(1)	(1)	(1)	52.70
Weaverville, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	5.10 (1)	(1)	(1)	(1)	52.70
Webster, Dak.	2.32 (1)	1.84 (1)	3.78 (1)	4.85 (1)	0.08 (1)	4.72 (1)	1.42 (1)	7.46 (1)	4.30 (1)	3.78 (1)	9.19 (1)	8.01 (1)	52.70
Weir's Bridge, N. H.	5.87 (1)	1.63 (1)	3.34 (1)	4.69 (1)	2.59 (1)	3.11 (1)	2.80 (1)	4.87 (1)	4.63 (1)	3.83 (1)	9.19 (1)	8.01 (1)	52.70
Weldon, N. C.	2.91 (1)	2.04 (1)	7.75 (1)	3.59 (1)	0.87 (1)	2.23 (1)	6.33 (1)	3.86 (1)	7.06 (1)	1.99 (1)	2.91 (1)	3.14 (1)	40.08
Wellington, Kans.	6.64 (1)	2.61 (1)	4.65 (1)	4.94 (1)	0.18 (1)	1.40 (1)	4.46 (1)	0.71 (1)	1.05 (1)	3.67 (1)	4.79 (1)	4.21 (1)	36.21
Wellsborough, Pa.	10.24 (1)	2.86 (1)	3.27 (1)	2.42 (1)	2.14 (1)	0.37 (1)	8.09 (1)	10.18 (1)	3.81 (1)	2.81 (1)	9.36 (1)	4.88 (1)	40.06
Wellsburg, W. Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	40.06
Wentworth, Dak.	4.00 (1)	2.40 (1)	2.27 (1)	2.02 (1)	2.42 (1)	2.84 (1)	3.60 (1)	5.20 (1)	3.51 (1)	0.90 (1)	8.90 (1)	1.70 (1)	40.06
Wentworth, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	40.06
Westborough, Mass.	2.60 (1)	0.93 (1)	1.88 (1)	5.54 (1)	(1)	3.65 (1)	6.25 (1)	7.12 (1)	5.11 (1)	4.29 (1)	2.66 (1)	8.75 (1)	57.56
Westerville, Ohio	2.54 (1)	6.20 (1)	4.45 (1)	7.32 (1)	2.30 (1)	4.45 (1)	7.32 (1)	4.62 (1)	6.09 (1)	2.94 (1)	3.64 (1)	7.52 (1)	57.56
Westerville, Ohio	2.85 (1)	1.83 (1)	2.46 (1)	5.22 (1)	3.77 (1)	3.49 (1)	1.97 (1)	4.62 (1)	2.32 (1)	1.75 (1)	3.58 (1)	3.08 (1)	37.33
West Leavenworth, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	37.33
Westmoreland, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	37.33
White Bluff, Tenn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	37.33
White Plains, N. Y.	1.80 (1)	0.90 (1)	1.70 (1)	4.65 (1)	1.60 (1)	2.45 (1)	3.20 (1)	4.35 (1)	5.31 (1)	2.70 (1)	4.20 (1)	6.40 (1)	41.86
Wilkes Barre, Pa.	7.03 (1)	0.68 (1)	8.19 (1)	3.13 (1)	1.45 (1)	1.99 (1)	1.75 (1)	3.76 (1)	4.56 (1)	3.40 (1)	2.87 (1)	2.51 (1)	41.86
Willsboro, N. H.	4.59 (1)	2.93 (1)	2.64 (1)	3.53 (1)	1.65 (1)	1.99 (1)	1.75 (1)	3.76 (1)	4.56 (1)	3.40 (1)	2.87 (1)	2.51 (1)	41.86
Willsboro, N. H.	4.59 (1)	2.93 (1)	2.64 (1)	3.53 (1)	1.65 (1)	1.99 (1)	1.75 (1)	3.76 (1)	4.56 (1)	3.40 (1)	2.87 (1)	2.51 (1)	41.86
Woodsstock, Md.	4.36 (1)	1.75 (1)	2.74 (1)	3.53 (1)	2.42 (1)	3.27 (1)	4.7 (1)	5.66 (1)	5.43 (1)	1.83 (1)	4.29 (1)	3.74 (1)	41.86

Wendell, N. H.	6.30	2.22	2.03	4.55	3.29	2.77	2.09	5.32	5.72	2.26	(1)	1.48	.....
Wendstock, Vt.	5.56	1.04	2.83	3.30	2.15	2.38	3.23	3.02	4.48	2.31	3.00	1.88	31.86
Worcester, Mass.	(1)	(1)	1.54	4.32	1.40	2.48	5.04	6.23	2.37	4.20	2.50	1.88	.....
Wyandotte, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.51	2.64	2.48	2.76	4.06	.....
Wytheville, Va.	0.89	(1)	(1)	4.13	2.64	(1)	3.02	5.33	5.04	2.83	2.41	5.01	.....
Yates Centre, Kans.	3.12	1.27	0.44	3.84	0.48	1.43	0.48	1.04	1.09	3.88	1.35	2.46	.....

No record.

**Monthly and annual precipitation at military post hospitals, from July, 1883, to June, 1884, inclusive.**

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MacIntosh, Fort, Mont.	0.28	0.37	0.66	4.06	1.12	0.39	1.47	0.69	0.56	0.62	0.76	1.21	13.19
Macon, Fort, Cal.	0.00	0.00	0.64	4.12	( <sup>1</sup> )	1.23	2.90	3.24	5.94	4.34	( <sup>1</sup> )	2.00	22.66
McDonnell, Fort, Nev.	( <sup>1</sup> )	1.36	0.24	0.90	1.06	1.22	6.72	4.80	5.94	4.34	( <sup>1</sup> )	2.00	80.10
McDowell, Fort, Ariz.	1.12	1.76	0.32	0.80	0.06	4.23	0.14	4.37	4.66	4.52	0.45	4.44	16.86
McHenry, Fort, Md.	2.65	4.00	5.34	1.94	0.63	4.98	5.38	5.89	5.42	1.86	2.49	3.04	43.42
Meade, Fort, Dak.	2.90	0.18	1.60	0.67	0.03	0.72	0.37	0.33	2.26	5.04	8.68	0.43	33.08
Mitchell, Camp, Ga.	( <sup>1</sup> )	2.70	0.63	2.43	4.66	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	...
Mojave, Fort, Ariz.	0.15	0.00	0.42	0.10	( <sup>1</sup> )	1.23	0.00	1.90	( <sup>1</sup> )	0.67	0.29	0.00	...
Monroe, Fort, Va.	3.02	0.60	2.44	4.10	0.78	1.50	5.10	2.56	6.53	1.42	1.53	3.99	34.57
Mount Vernon Barracks, Ala.	3.37	1.67	0.07	0.97	2.64	3.31	5.45	4.76	14.68	5.61	7.75	7.75	56.57
Niagara, Fort, N. Y.	2.66	2.45	1.97	1.73	1.49	1.89	2.25	2.75	2.37	0.71	( <sup>1</sup> )	1.16	...
Niobrara, Fort, Nebr.	2.34	0.82	2.16	0.53	0.04	1.02	0.23	0.34	1.98	( <sup>1</sup> )	1.25	( <sup>1</sup> )	...
Pembina, Fort, Dak.	1.11	2.63	0.53	1.75	0.63	1.73	1.83	0.50	1.81	1.06	2.29	( <sup>1</sup> )	...
Plattsburg Barracks, N. Y.	3.40	1.17	2.49	1.75	3.02	2.82	3.60	4.13	3.49	2.14	( <sup>1</sup> )	1.80	23.76
Preble, Fort, Mo.	8.86	0.40	1.92	5.17	( <sup>1</sup> )	0.96	0.58	0.24	5.96	1.86	0.14	( <sup>1</sup> )	...
Presidio, Cal.	0.00	0.00	0.34	0.74	1.64	3.51	0.58	4.13	2.96	5.10	0.80	1.93	24.09
Randall, Fort, Dak.	4.80	1.90	1.50	2.20	( <sup>1</sup> )	3.51	0.46	0.47	( <sup>1</sup> )	2.80	1.70	4.31	...
Reno, Fort, Ind. T.	3.59	5.53	2.10	6.52	0.18	1.20	0.40	0.18	( <sup>1</sup> )	3.64	6.79	4.44	...
Robinson, Fort, Nebr.	0.18	2.05	0.00	1.22	0.50	1.97	0.67	0.50	1.49	2.80	2.85	1.53	...
Saint Augustine, Fla.	5.81	1.84	3.51	2.59	0.23	0.26	1.83	3.43	1.92	2.14	1.73	7.43	...
Shaw, Fort, Mont.	0.08	0.97	0.66	2.22	0.43	0.96	0.83	0.83	0.41	0.59	0.74	0.97	32.55
Sisseton, Fort, Dak.	2.23	1.97	0.00	2.07	0.00	0.35	0.35	0.83	6.83	1.26	2.00	1.32	8.08
Snelling, Fort, Minn.	4.14	1.12	1.90	1.40	0.76	1.09	1.67	1.34	0.86	1.88	2.42	5.42	14.13
Spokane, Fort, Wash. T.	0.00	( <sup>1</sup> )	0.06	1.60	1.20	1.50	0.90	1.02	0.43	1.80	( <sup>1</sup> )	1.52	...
Sully, Fort, Dak.	3.28	2.08	0.08	1.24	0.00	0.86	0.29	0.47	0.87	2.28	2.04	3.00	17.49
Totten, Fort, Dak.	1.84	1.46	0.14	4.16	0.73	0.86	0.68	0.54	0.96	2.90	0.98	1.89	19.08
Townsend, Fort, Wash. T.	0.60	0.80	0.55	2.47	3.01	2.84	2.36	1.77	0.11	2.10	0.97	2.23	18.81
Union, Fort, N. Mex.	2.80	4.81	2.96	1.94	0.00	1.12	0.18	0.54	0.26	0.28	4.93	3.06	22.90
Verde, Fort, Ariz.	3.35	1.18	0.00	0.45	0.00	4.30	0.39	3.59	3.60	1.43	0.72	0.23	18.20
Warren, Fort, Mass.	1.46	0.54	1.12	1.23	0.23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	...
Washakie, Fort, Wyo.	( <sup>1</sup> )	0.20	0.80	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	...
West Point, N. Y.	2.80	4.50	3.40	6.30	0.00	( <sup>1</sup> )	( <sup>1</sup> )	0.50	( <sup>1</sup> )	2.30	3.80	2.60	...
Wingate, Fort, N. Mex.	4.04	2.74	0.46	1.14	0.00	1.44	0.23	0.35	0.29	1.50	1.94	1.18	...
Yates, Fort, Dak.	0.99	0.09	( <sup>1</sup> )	0.42	0.00	0.43	0.23	0.35	0.29	1.50	1.94	1.18	...

No record.

Rainfall inappreciable.

## APPENDIX 56.

Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, for the year ending June 30, 1884.

[Copied from the records on file at the office of the chief engineer Central Pacific Railroad, by the observer at San Francisco, Cal.]

Stations.	1883.							1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Annual.
Alta, Cal.	0.00	0.00	0.00	1.60	2.05	3.10	3.50	8.60	7.70	5.20	1.75	2.00	26.17
Anaheim, Cal.	0.00	0.00	0.00	1.12	0.00	1.40	2.80	10.58	6.70	1.75	0.54	1.28	26.17
Antioch, Cal.	0.00	0.00	0.13	0.70	0.55	0.20	3.50	8.64	5.73	2.62	0.00	1.15	18.23
Auburn, Cal.	0.00	0.00	1.70	2.51	1.00	2.32	5.33	7.63	10.17	3.62	0.85	1.28	40.98
Battle Mountain, Nev.	0.00	0.00	0.00	0.85	0.70	0.40	0.70	0.23	1.04	1.54	1.20	1.18	8.93
Benson, Ariz.	2.97	2.73	0.10	0.21	0.07	0.50	0.20	0.63	1.20	0.77	1.20	0.00	10.18
Beowawe, Nev.	0.00	0.00	0.00	1.14	0.60	0.82	0.75	1.60	0.94	0.77	1.20	0.00	10.18
Bishop's Creek, Nev.	0.00	0.00	0.00	0.94	0.00	0.33	0.00	0.70	0.00	0.00	0.00	0.00	10.18
Blue Creek, Utah	0.80	0.40	0.50	0.70	0.00	0.00	1.14	0.70	0.00	0.00	1.01	0.00	10.18
Boca, Cal.	0.00	0.00	0.00	2.45	0.50	0.00	4.00	6.30	3.10	2.15	1.00	1.40	16.96
Borden, Cal.	0.00	0.00	0.00	0.62	0.20	0.31	1.98	4.48	3.29	2.47	1.77	1.73	16.96
Brentwood, Cal.	0.00	0.00	0.00	0.80	0.53	0.70	2.62	3.84	4.18	2.23	0.11	1.51	16.43
Brighton, Cal.	0.00	0.00	0.00	0.66	0.39	0.44	2.06	3.68	5.32	3.54	0.23	1.55	18.71
Brown's, Nev.	0.00	0.00	0.00	0.75	0.28	0.07	0.06	0.68	0.86	0.73	0.11	0.40	4.10
Byron, Cal.	0.00	0.00	0.00	0.80	0.53	0.71	2.41	4.98	5.61	2.50	0.00	1.84	18.35
Callenta, Cal.	0.00	0.00	0.00	0.76	0.05	0.11	2.00	4.15	5.01	2.80	1.10	1.28	18.35
Callista, Cal.	0.00	0.00	0.00	1.02	0.24	1.82	6.87	4.42	9.78	5.98	0.43	2.06	33.63
Camp Wright, Cal.	0.00	0.00	0.00	1.17	0.00	1.54	0.00	1.79	1.82	1.42	1.53	1.85	12.26
Carlin, Nev.	0.00	0.58	0.00	0.10	0.00	1.55	1.20	1.00	1.08	0.00	0.00	0.00	12.26
Casa Grande, Ariz.	0.00	0.81	0.00	0.00	0.00	0.86	0.46	2.16	1.08	0.00	0.40	2.11	21.44
Chico, Cal.	0.00	0.00	0.85	8.78	0.00	0.50	2.48	2.16	5.57	2.93	0.00	1.78	21.44
Chuslar, Cal.	0.00	0.00	0.00	1.23	0.18	0.73	1.73	12.00	6.17	2.73	0.00	3.54	55.09
Clisco, Cal.	0.00	0.00	0.00	1.50	2.30	2.70	6.40	9.78	10.04	10.10	0.00	2.01	52.98
Colfax, Cal.	0.00	0.00	1.08	2.97	1.34	2.33	7.64	11.88	12.37	12.65	1.88	3.54	52.98
Colton, Cal.	0.00	0.00	0.00	0.00	1.00	2.33	1.00	9.78	4.05	2.88	2.99	0.00	15.43
Cotton, Ariz.	0.00	0.00	0.00	0.00	1.25	0.80	0.00	11.88	8.90	3.10	1.19	0.00	15.43
Deer Creek, Ariz.	0.48	0.20	0.00	1.05	0.00	0.00	0.00	1.00	3.10	2.10	0.00	0.00	15.43
Deer Valley, Cal.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	3.90	3.10	0.00	0.00	15.43
Delano, Cal.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	3.90	3.10	0.00	0.00	15.43
El Centro, Cal.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	3.90	3.10	0.00	0.00	15.43
Imperial, Cal.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	3.90	3.10	0.00	0.00	15.43
Imperial, Cal.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	3.90	3.10	0.00	0.00	15.43

El Paso, Tex.	1.49	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1
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**Inappreciable.**

**Record incomplete.**

**No record.**



Monthly and annual precipitation in inches and hundredths, at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	1893.						1894.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Pleasanton, Cal.	0.00	0.00	0.35	1.47	0.83	0.66	2.40	6.18	6.53	2.14	0.05	1.78
Promontory, Utah.	0.60	0.08	0.15	1.20	0.83	0.41	0.90	1.75	1.08	4.37	1.43	1.73
Raymond, Cal.	0.00	0.00	0.24	0.70	0.10	1.04	4.58	0.50	0.05	2.15	0.20	1.03
Red Bluff, Cal.	0.00	0.00	1.00	2.85	0.20	0.63	4.73	2.60	7.50	4.36	0.25	1.24
Redding, Cal.	0.00	0.00	(1)	4.09	0.67	(1)	3.45	3.94	7.50	2.65	0.00	0.00
Benio, Nev.	0.00	0.00	0.00	(1)	0.00	0.00	1.70	1.25	1.30	0.35	0.00	0.00
Rocklin, Cal.	0.00	0.00	1.10	1.27	0.60	0.68	3.27	4.56	5.77	4.19	0.00	0.00
Sacramento, Cal.	0.00	0.00	0.65	0.76	0.53	0.52	2.71	3.85	6.50	3.60	0.00	0.00
Salinas City, Cal.	0.00	0.00	0.20	1.15	0.28	0.87	1.52	4.63	4.60	2.87	0.71	1.25
San Fernando, Cal.	0.00	0.00	0.00	0.00	0.00	2.76	3.00	10.60	10.51	3.48	1.06	2.54
San José, Cal.	0.00	0.00	(1)	0.67	0.28	0.27	3.18	8.63	3.23	3.38	0.05	2.15
San Mateo, Cal.	0.00	0.00	0.30	1.14	0.31	0.92	3.40	4.83	3.85	3.40	0.05	2.91
San Simon, Ariz.	1.25	2.54	0.70	0.15	0.35	0.45	0.40	0.60	2.31	0.00	0.84	0.08
Santa Cruz, Cal.	0.00	0.00	0.54	1.42	0.95	1.07	3.30	3.27	3.76	0.00	0.24	2.43
Soledad, Cal.	0.00	0.00	0.06	0.43	0.17	0.45	2.74	4.24	3.74	1.67	1.13	1.56
Southern, Cal.	(1)	0.00	0.00	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Smith Valley, Cal.	0.00	0.00	0.61	0.56	0.43	0.73	2.52	3.21	6.06	2.14	0.00	1.74
Stockton, Cal.	0.00	0.00	0.00	0.95	0.00	1.30	2.90	8.80	7.00	2.25	0.55	0.75
Stockton, Cal.	0.00	0.00	0.50	0.88	0.49	0.81	1.63	4.02	5.77	2.65	0.81	1.05
Summit, Cal.	0.00	0.00	0.58	0.15	0.32	0.70	2.64	4.43	6.33	2.78	0.30	1.09
Summit, Cal.	0.00	0.00	0.10	0.95	1.20	3.20	7.60	4.48	9.10	12.00	0.80	1.60
Summer, Cal.	0.00	0.00	0.00	0.30	0.05	0.20	1.43	3.20	1.05	0.27	1.74	0.90
Tecoma, Nev.	0.05	0.15	0.00	0.80	0.38	0.36	0.10	0.57	0.33	2.16	1.10	0.50
Tehama, Cal.	0.00	0.00	1.03	1.70	(1)	0.44	3.15	2.08	4.94	2.61	(1)	1.53
Tehachas, Cal.	0.00	0.00	0.37	0.81	0.14	0.72	1.54	2.08	4.45	1.85	1.26	1.05
Tennant, Cal.	0.00	0.00	0.00	0.96	0.38	1.01	5.23	5.96	10.09	4.19	1.03	1.42
Terra, Utah.	0.15	(1)	0.37	0.90	0.45	0.30	0.22	1.81	1.75	1.23	0.28	0.46
Texas Hill, Ariz.	0.68	0.70	0.00	0.09	(1)	0.05	0.70	0.78	0.68	0.23	1.03	0.00
Tucson, Nev.	0.83	0.00	0.00	0.47	0.85	0.60	0.00	2.43	3.37	1.65	0.10	0.35
Tracy, Cal.	0.00	0.00	0.20	0.00	0.50	0.55	0.65	11.30	5.30	3.90	0.06	0.00
Tuolumne, Cal.	0.33	0.00	0.10	2.46	0.50	1.60	0.08	3.80	2.94	1.95	0.00	0.10
Tucson, Ariz.	2.30	1.40	0.45	0.36	0.05	0.06	1.68	3.97	2.94	0.20	0.00	0.25
Tulare, Cal.	0.00	0.00	0.10	0.00	0.00	0.08	1.47	2.84	2.64	1.97	0.48	0.10
Wadsworth, Cal.	0.00	0.00	0.10	0.21	0.32	0.51	1.67	2.04	1.58	1.07	0.37	1.58
Wells, Nev.	0.36	0.38	0.13	0.78	0.00	0.00	1.10	2.00	1.17	1.16	1.48	0.50
White Water, Cal.	0.00	0.00	0.00	0.18	0.00	0.00	1.10	2.00	1.17	1.16	1.48	0.50
White Water, Cal.	0.00	0.00	0.00	0.18	0.00	0.00	1.10	2.00	1.17	1.16	1.48	0.50

	No record.				Record incomplete.				Inappreciable.			
	1.00	2.15	0.04	0.30	0.35	0.80	0.04	2.44	1.86	0.02	0.01	0.11
Willcox, Ariz.	1.00	(1)	0.30	0.30	0.05	0.15	2.01	1.53	3.93	1.94	(1)	2.96
Willows, Cal.	0.00	0.00	0.41	1.30	0.12	0.05	1.42	2.11	4.80	2.56	0.12	0.90
Willows, Cal.	0.00	0.00	0.41	1.30	0.12	0.05	1.42	2.11	4.80	2.56	0.12	0.90
Winchester, Nev.	0.00	0.00	0.41	1.30	0.12	0.05	1.42	2.11	4.80	2.56	0.12	0.90
Woodland, Cal.	0.00	0.00	0.41	1.30	0.12	0.05	1.42	2.11	4.80	2.56	0.12	0.90
Yuma, Ariz.	(1)	0.00	0.13	0.05	(1)	1.41	(1)	1.11	1.43	0.07	0.27	(1)

## APPENDIX 57.

Table showing the precipitation at the special cotton-region stations of the Signal Service, United States Army, for the months July to October, 1883, and April to June, 1884, both inclusive.

Stations.	1883.				1884.		
	July.	August.	September.	October.	April.	May.	June.
Wilmington, N. C.:	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cheraw, S. C.	2.33	2.56	5.56	2.63	2.33	4.06	4.84
Florence, S. C.	2.65	1.43	8.63	2.01	2.72	4.66	7.39
Goldaborough, N. C.	7.43	6.26	16.39	2.99	2.75	2.94	6.71
Lumberton, N. C.	2.41	2.20	12.50	2.10	2.70	4.23	5.60
New Bern, N. C.					12.64	2.12	4.04
Raleigh, N. C.					21.96	1.25	5.82
Salisbury, N. C.	1.46	1.43	3.70	( <sup>a</sup> )	4.67	3.10	5.39
Wadesborough, N. C.	1.55	2.24	4.00	( <sup>a</sup> )	1.50	2.28	2.11
Weldon, N. C.	2.45	2.58	8.82	( <sup>a</sup> )	2.22	2.68	2.36
Charleston, S. C.:							
Branchville, S. C.	3.62	4.09	3.09	0.67	4.62	1.58	6.55
Hardenville, S. C.	4.36	4.05	2.89	1.65	3.91	1.97	12.59
Jacksonborough, S. C.	4.33	7.10	6.02	2.11	4.71	0.96	4.35
Kingstree, S. C.	3.82	2.23	6.46	2.24	3.91	3.18	4.14
Saint George's, S. C.	4.24	5.52	3.07	0.45	3.66	2.32	2.79
Saint Mathew's, S. C.	2.78	5.25	5.06	1.90	4.17	4.74	5.61
Yemassee, S. C.	2.54	11.17	2.80	0.57	5.18	5.68	5.55
Augusta, Ga.:							
Allendale, S. C.	0.39	1.82	0.53	1.77	4.53	2.40	4.86
Athens, Ga.	2.03	1.68	0.82	1.25	6.09	0.34	10.11
Batesburg, S. C.					( <sup>a</sup> )	( <sup>a</sup> )	5.25
Blackville, S. C.					( <sup>a</sup> )	( <sup>a</sup> )	5.33
Camak, Ga.					( <sup>a</sup> )	( <sup>a</sup> )	5.44
Chester, S. C.	1.40	0.00	( <sup>a</sup> )	3.54	4.22	4.18	8.99
Columbia, S. C.	4.51	1.41	4.02	2.84	3.93	3.00	5.12
Covington, Ga.	1.02	3.85	1.37	51.56			
Greenwood, S. C.					( <sup>a</sup> )	( <sup>a</sup> )	10.51
Union Point, Ga.	0.43	4.23	0.36	6.69	( <sup>a</sup> )	2.10	( <sup>a</sup> )
Washington, Ga.					( <sup>a</sup> )	21.16	6.74
Waynesborough, Ga.					( <sup>a</sup> )	( <sup>a</sup> )	3.22
Savannah, Ga.:							
Albany, Ga.	1.45	6.17	0.96	0.00	2.75	1.12	5.89
Alapaha, Ga.	4.15	3.87	0.10	1.40	2.41	1.77	5.67
Bainbridge, Ga.	0.29	0.15	0.48	0.00	6.40	0.24	6.61
Eastman, Ga.	6.06	4.87	2.53	( <sup>a</sup> )	1.68	0.02	0.30
Fernandina, Fla.	4.26	6.41	5.14	3.94	1.85	2.04	8.31
Fort Gaines, Ga.	1.45	23.57	0.14	0.03	3.44	1.90	11.40
Jesup, Ga.	2.62	9.22	3.14	0.50	3.86	0.69	6.63
Live Oak, Fla.	7.85	4.61	1.51	0.13	1.63	2.49	8.23
Millen, Ga.	0.81	3.50	3.67	0.26	4.65	2.11	5.80
Quitman, Ga.	3.51	4.41	1.94	0.00	10.26	0.89	8.13
Smithville, Ga.	2.81	1.08	1.33	0.00	2.07	1.05	5.39
Thomasville, Ga.	3.14	7.37	4.59	0.60	4.38	2.01	10.15
Waldo, Fla.	4.33	6.63	3.78	0.45	3.39	6.55	0.73
Way Cross, Ga.	1.90	0.33	0.13	0.15	4.17	2.53	7.87
Vicksburg, Miss.:							
Edwards, Miss.	3.38	2.72	0.91	6.31	4.57	8.84	5.61
Jackson, Miss.	4.20	5.60	0.00	4.85	4.25	6.06	2.60
Lake, Miss.	2.70	2.22	0.00	2.30	4.14	7.06	1.26
Monroe, La.	3.51	0.69	1.50	7.52	4.82	8.50	2.71
Atlanta, Ga.:							
Anderson, S. C.					( <sup>a</sup> )	( <sup>a</sup> )	7.22
Calhoun, Ga.	1.08	5.01	2.90	23.40			
Cartersville, Ga.	1.80	5.62	0.98	2.50	7.60	2.11	7.34
Columbus, Ga.	1.07	3.16	1.98	0.52	1.82	0.50	5.23
Dalton, Ga.	1.45	3.02	4.58	2.16	4.31	2.54	6.21
Gainesville, Ga.	0.86	6.29	0.70	2.30	7.51	1.02	12.19
Greenville, S. C.					5.68	1.96	8.09
Griffin, Ga.	1.57	12.90	0.85	1.75	4.53	1.16	12.22
Macon, Ga.	3.45	5.28	0.85	1.00	1.86	2.40	8.30

<sup>1</sup> 19 days only.<sup>2</sup> 16 days only.<sup>3</sup> No record.<sup>4</sup> Record incomplete.<sup>5</sup> Station closed.

Table showing precipitation at special cotton-region stations, &amp;c.—Continued.

Stations.	1883.				1884.		
	July.	August.	September.	October.	April.	May.	June.
<b>Atlanta, Ga.—Continued.</b>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Madison, Ga.	1.09	2.99	1.40	1.63	4.24	( <sup>1</sup> )	
Newnan, Ga.	1.18	6.47	0.50	8.13	6.02	1.64	10.55
Spartanburg, S. C.	0.72	1.68	2.96	8.37	4.65	2.06	0.90
Toccoa, Ga.	0.43	4.03	1.29	2.97	5.53	1.09	9.78
West Point, Ga.	2.19	2.57	0.75	2.46	3.69	0.97	9.94
<b>Montgomery, Ala.:</b>							
Birmingham, Ala.	0.77	5.56	( <sup>2</sup> )	0.06	6.87	0.42	4.48
Calera, Ala.	1.80	0.11	1.50	0.17	3.50	1.30	7.53
Demopolis, Ala.	1.02	4.52	0.23	1.27	( <sup>2</sup> )		
Eufaula, Ala.					( <sup>2</sup> )	41.04	8.60
Fort Deposit, Ala.					( <sup>2</sup> )	50.18	4.56
Greenville, Ala.	3.23	3.75	0.60	1.18	3.86	1.63	9.72
Marion, Ala.					( <sup>2</sup> )	0.00	6.65
Opelika, Ala.	2.94	2.50	0.66	2.58	3.10	0.64	10.15
Pine Apple, Ala.	1.26	1.68	0.48	1.05	3.23	2.66	4.50
Selma, Ala.	0.71	3.65	0.87	1.32	1.77	1.40	5.46
Talladega, Ala.	0.30	1.31	0.04	0.30	( <sup>2</sup> )	( <sup>1</sup> )	
Tuscaloosa, Ala.	1.45	2.05	1.95	0.40			
Uniontown, Ala.	0.10	1.77	0.25	0.45	( <sup>2</sup> )	( <sup>1</sup> )	
<b>Mobile, Ala.:</b>							
Aberdeen, Miss.	0.95	2.80	1.34	6.56	2.81	1.79	6.74
Columbus, Miss.	1.39	4.62	0.07	3.74	4.59	2.29	7.01
Evergreen, Ala.					( <sup>2</sup> )	( <sup>2</sup> )	3.15
Livingston, Ala.					2.19	3.51	5.41
Macon, Miss.	0.11	0.05	0.10	2.60	4.82	3.05	7.78
Okolona, Miss.	0.06	0.69	0.20	1.71	3.70	8.10	7.20
State Line, Miss.	2.97	1.11	0.16	1.18			
Waynesborough, Miss.	1.12	( <sup>2</sup> )	0.00	( <sup>2</sup> )	2.26	4.15	3.88
<b>New Orleans, La.:</b>							
Alexandria, La.	3.10	0.80	( <sup>6</sup> )	2.30	( <sup>2</sup> )	7.28	10.19
Brookhaven, Miss.	4.94	3.73	1.81	7.09	4.71	11.83	6.90
Cheneyville, La.	3.52	2.12	1.71	0.04	( <sup>6</sup> )	8.75	3.40
Coushatta Chute, La.	2.55	0.06	2.16	3.10	6.74	13.01	3.08
Franklin, La.	3.90	1.99	0.65	10.87			
Lafayette, La.	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	3.85	6.49	2.54
Minden, La.					6.17	9.64	3.06
Morgan City, La.	5.30	1.62	0.10	11.81			
Natchez, Miss.					2.55	7.65	4.13
Natchitoches, La.	0.70	1.05	0.00	4.59	4.08	8.67	5.67
New Iberia, La.	1.26	1.08	1.25	( <sup>1</sup> )			
Opelousas, La.					3.80	8.29	3.30
Pass Christian, Miss.	0.81	0.44	0.01	10.30			
Scranton, Miss.	1.69	1.08	1.59	11.09			
Terre Bonne, La.	4.69	2.01	2.14	13.55			
Whiteville, La.	3.98	2.00	1.75	2.35	5.74	11.34	4.31
<b>Galveston, Tex.:</b>							
Austin, Tex.	6.28	0.13	3.55	( <sup>2</sup> )	6.67	( <sup>2</sup> )	0.26
Beaumont, Tex.	5.26	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	11.51	5.07	0.45
Belton, Tex.	2.63	0.05	0.24	( <sup>2</sup> )	5.39	7.11	2.07
Columbia, Tex.					( <sup>2</sup> )	( <sup>2</sup> )	2.17
Corpus Christi, Tex.	1.21	0.02	0.20	1.43	3.37	12.58	4.35
Cuero, Tex.	1.71	0.26	4.58	2.58	1.60	6.89	2.19
Dallas, Tex.	2.02	1.34	1.50	4.05	5.55	8.25	4.99
Hearne, Tex.	1.22	( <sup>6</sup> )	1.65	2.01	4.26	10.10	0.70
Hempstead, Tex.	2.04	1.92	2.38	( <sup>2</sup> )	2.27	14.60	0.90
Houston, Tex.	2.20	0.37	7.45	3.21	4.39	16.88	4.30
Huntsville, Tex.	1.55	0.95	2.00	2.23	2.56	13.05	1.61
Longview, Tex.	0.17	0.08	( <sup>2</sup> )	( <sup>2</sup> )	0.38	4.98	3.42
Luling, Tex.	4.03	0.00	5.50	3.69	43.98	7.17	1.11
Orange, Tex.	0.40	0.23	0.14	0.17	2.80	3.20	( <sup>2</sup> )
San Antonio, Tex.		0.54	1.98	3.75		6.79	0.43
Sour Lake, Tex.	3.37	3.44	1.75	0.69	51.68	8.43	6.95
Tyler, Tex.	0.17	0.26	1.75	2.11	5.79	17.47	3.75
Waco, Tex.	0.89	0.19	1.39	1.88	5.03	9.66	1.44
Weatherford, Tex.	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	2.79	1.50	27.04	12.16
Weimar, Tex.	0.55	0.02	2.94	3.12	6.03	11.56	1.12
<b>Little Rock, Ark.:</b>							
Arkansas City, Ark.	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	3.36	( <sup>2</sup> )	4.62
Brinkley, Ark.	2.06	2.40	1.15	2.10	10.79	5.00	2.44
Devall's Bluff, Ark.	2.08	0.09	0.21	0.63	1.57	4.08	1.60
Helena, Ark.					( <sup>2</sup> )	( <sup>2</sup> )	3.18
Kensett, Ark.	0.99	3.13	2.40	5.30	6.48	5.34	1.04

<sup>1</sup> Station closed.<sup>2</sup> Record incomplete.<sup>3</sup> 19 days only.<sup>4</sup> 16 days only.<sup>5</sup> No record.<sup>6</sup> 20 days only.<sup>7</sup> Inappreciable.<sup>8</sup> 18 days only.

Table showing precipitation at special cotton-region stations, &amp;c.—Continued.

Stations.	1883.				1884.		
	July.	August.	September.	October.	April.	May.	June.
<b>Little Rock, Ark.—Continued.</b>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Madison, Ark.....	2.29	0.62	0.99	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	4.67
Magnolia, Ark.....					( <sup>1</sup> )	( <sup>2</sup> )	4.48
Malvern, Ark.....	0.18	0.32	1.50	3.55	2.34	4.88	4.58
Monticello, Ark.....	3.01	1.51	0.12	2.29	5.77	4.56	2.94
Newport, Ark.....					7.65	2.92	2.23
Paris, Tex.....	0.88	5.79	0.10	( <sup>1</sup> )	2.79	3.86	4.01
Pine Bluff, Ark.....						*2.21	3.51
Prescott, Ark.....	*0.71	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	13.32	6.23	( <sup>2</sup> )
Russellville, Ark.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	1.57	1.67
Texarkana, Ark.....	0.06	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	10.96	7.49	2.56
Walnut Ridge, Ark.....	2.23	0.18	0.08	( <sup>2</sup> )			
<b>Memphis, Tenn.:</b>							
Batesville, Miss.....	1.28	2.58	( <sup>1</sup> )	( <sup>1</sup> )	11.90	4.49	5.39
Bolivar, Tenn.....					( <sup>1</sup> )	*2.79	2.79
Brownsville, Tenn.....	4.80	1.03	1.17	6.34	6.34	5.97	2.19
Clarksville, Tenn.....	2.17	2.89	1.56	*2.91			
Corinth, Miss.....	5.26	2.69	0.92	5.65	6.25	4.62	7.57
Covington, Tenn.....					( <sup>1</sup> )	( <sup>1</sup> )	3.79
Decatur, Ala.....	2.74	4.51	2.51	4.59	7.13	1.42	4.21
Dyersburg, Tenn.....					( <sup>1</sup> )	( <sup>2</sup> )	4.25
Erin, Tenn.....	0.11	0.07	0.13	*0.25			
Grand Junction, Tenn.....	2.61	4.29	0.57	6.73	7.94	2.97	6.58
Grenada, Miss.....	2.17	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1.10	1.59	( <sup>1</sup> )
Hernando, Miss.....	1.19	1.59	0.41	5.22	3.68	4.28	4.95
Holly Springs, Miss.....					( <sup>1</sup> )	*1.74	7.62
Milan, Tenn.....	5.68	5.22	0.69	4.74	4.68	5.46	2.51
Oxford, Miss.....					( <sup>1</sup> )	2.47	4.21
Paris, Tenn.....	5.20	2.57	1.09	6.73	1.56	1.22	0.81
Scottsborough, Ala.....	2.18	2.08	4.79	2.08	7.27	2.62	5.99
Tusculum, Ala.....	5.00	3.88	0.35	7.00	7.19	2.63	2.67
Withe, Tenn.....	2.92	9.95	0.79	1.23	2.75	4.65	1.36

<sup>1</sup> No record.<sup>2</sup> Record incomplete.<sup>3</sup> 13 days only.<sup>4</sup> 17 days only.<sup>5</sup> Station closed.

Monthly and annual mean relative humidity at stations of the Signal Service, United States Army, for the year ending June 30, 1884.

[Deduced from observations taken at 7 a. m., 8 and 11 p. m., Washington time. The daily means are obtained by dividing the sum of the 7 a. m., 8 and 11 p. m. observations by 3; the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Albany, N. Y.	62.9	60.8	62.1	65.1	65.6	70.0	61.2	67.4	68.8	61.5	60.8	58.6
Alpena, Mich.	70.6	70.7	77.6	75.8	80.6	78.7	78.2	75.9	72.6	67.0	60.8	58.6
Apache, Fort, Ariz.	60.4	60.6	59.0	56.4	53.0	70.5	65.9	70.1	71.8	57.7	71.9	73.7
Ashtabula, Fort, Mont.	48.8	51.0	54.4	65.8	63.6	67.0	73.8	84.3	81.1	68.5	54.9	59.7
Atlanta, Ga.	60.9	70.4	67.8	74.8	64.1	68.7	70.9	63.0	63.8	59.3	59.4	57.2
Atlantic City, N. J.	72.9	76.0	77.5	73.5	72.0	76.8	76.9	83.2	82.0	72.4	70.2	51.7
Augusta, Ga.	64.7	68.0	76.8	71.8	68.3	70.0	68.2	66.3	65.8	68.8	65.5	74.7
Baltimore, Md.	67.3	68.7	71.2	72.0	64.2	67.3	68.2	68.6	67.5	67.8	59.0	65.9
Barnegat City, N. J.	81.6	76.7	80.5	78.6	74.0	75.7	77.7	81.1	77.3	71.8	74.5	77.6
Bennett, Fort, Dak.	68.1	68.4	61.0	68.2	49.4	75.8	78.9	74.5	76.4	58.5	64.3	61.0
Benton, Fort, Mont.	44.4	44.4	54.4	62.6	56.7	48.0	60.0	87.3	78.5	72.8	63.6	61.0
Bismarck, Dak.	62.7	62.2	60.4	78.6	56.1	65.9	86.7	86.3	78.5	78.8	63.6	73.0
Black Island, R. I.	82.2	79.6	73.7	79.1	78.8	80.6	80.2	86.3	73.5	83.9	64.5	83.9
Boise City, Idaho.	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	73.7	73.7	( <sup>a</sup> )	80.2	86.3	73.5	83.9	64.5	83.9
Boston, Mass.	71.7	69.8	72.8	73.9	70.5	77.7	73.3	77.4	69.1	66.7	70.4	74.5
Brownsville, Tex.	78.1	74.4	80.6	74.5	81.8	84.8	78.4	77.1	80.4	82.9	67.8	77.8
Buffalo, N. Y.	73.9	71.4	74.6	78.7	70.0	67.0	84.2	84.0	78.9	70.7	75.0	70.5
Bufo, Fort, Dak.	68.9	66.7	61.3	73.7	63.8	68.0	87.9	84.8	83.6	72.1	67.9	60.0
Caizo, Ill.	72.8	72.3	72.3	73.4	68.7	69.9	76.6	75.4	68.5	68.0	69.9	82.9
Camp, Fort, Wash. T.	( <sup>a</sup> )	( <sup>a</sup> )	84.9	79.4	80.8	80.5	76.6	75.4	68.5	68.0	69.9	82.9
Cape Henry, Va.	72.7	75.5	72.4	77.9	67.4	74.8	78.4	78.7	83.2	83.1	81.3	84.9
Cape May, N. J.	78.7	77.4	77.5	77.9	77.4	74.8	78.4	81.9	86.7	72.3	71.8	74.8
Cape Mendocino, Cal.	90.4	89.2	77.5	76.1	73.0	79.6	80.0	84.0	82.9	78.0	76.2	78.1
Cedar Keys, Fla.	72.9	74.6	80.6	79.5	78.2	82.1	78.2	78.0	79.6	82.8	84.5	82.4
Charleston, S. C.	81.5	82.6	83.6	80.6	77.1	85.2	83.8	78.7	78.0	71.7	72.2	75.3
Charlotte, N. C.	60.8	61.6	72.9	67.9	77.5	80.8	77.5	77.8	78.1	71.1	74.4	80.7
Chattanooga, Tenn.	63.6	63.0	62.0	63.4	63.4	63.8	71.0	70.6	68.9	58.3	64.5	75.8
Cheyenne, Wyo.	51.6	58.7	44.0	57.9	41.9	57.3	60.4	54.5	57.6	61.3	57.3	57.1

<sup>a</sup> Observations commenced September 1, 1883.  
<sup>b</sup> 28 days only.  
<sup>c</sup> 23 days only.

<sup>d</sup> 27 days only.  
<sup>e</sup> 26 days only.

<sup>f</sup> 20 days only.  
<sup>g</sup> 28 days only.  
<sup>h</sup> Record incomplete.

*Monthly and annual mean relative humidity at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	1883.					1884.					Annual mean.		
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.		May.	June.
Chicago, Ill.	Per cent. 68.6	Per cent. 68.2	Per cent. 69.1	Per cent. 71.8	Per cent. 68.2	Per cent. 70.2	Per cent. 68.6	Per cent. 69.5	Per cent. 67.7	Per cent. 67.6	Per cent. 65.5	Per cent. 73.0	Per cent. 68.9
Chincoteague, Va.	81.7	79.0	82.9	81.7	75.8	78.4	83.0	87.6	82.3	76.9	77.7	85.4	81.0
Cincinnati, Ohio	64.0	61.5	65.0	72.7	69.2	78.1	79.2	78.6	69.2	66.9	64.9	69.1	69.8
Cleveland, Ohio	67.5	63.5	67.1	68.2	63.1	75.3	75.9	84.8	77.1	68.5	69.5	69.2	71.2
Columbus, Ohio	65.4	62.7	66.2	72.0	63.0	71.0	75.8	76.0	68.4	66.8	63.4	69.0	66.4
Concho, Fort, Tex.	63.8	54.4	67.7	70.1	67.5	71.9	73.7	70.7	56.3	61.1	72.5	67.9	67.2
Custer, Fort, Mont.	( <sup>a</sup> )	44.7	56.2	79.8	67.5	72.5	78.0	77.9	81.0	64.9	65.9	67.7	66.8
Davenport, Iowa	70.4	69.1	67.1	72.5	65.5	64.0	56.1	49.8	63.7	61.9	64.3	72.0	66.8
Davis, Fort, Tex.	52.9	57.2	56.7	56.7	57.0	55.6	58.2	48.4	51.1	54.8	50.9	57.6	54.9
Dayton, Wash. T.	42.2	48.3	51.1	71.1	73.4	83.5	82.7	77.6	77.6	75.2	55.8	62.0	63.5
Deadwood, Dak.	73.2	70.6	71.4	177.9	69.4	71.4	75.5	77.4	77.0	74.6	68.4	67.0	72.9
Delaware Breakwater, Del.	80.2	78.2	83.5	80.7	75.9	77.9	81.3	85.6	84.1	77.6	74.9	83.1	80.3
Denver, Colo.	50.5	48.6	47.7	56.2	46.3	61.3	54.4	57.2	55.6	61.4	56.6	58.4	53.8
Des Moines, Iowa	71.5	71.4	67.4	74.0	63.4	66.0	62.9	65.2	67.1	61.4	62.9	72.7	67.2
Detroit, Mich.	71.7	66.2	71.9	73.2	72.1	76.0	72.9	77.3	72.5	62.7	61.3	67.4	70.4
Dodge City, Kans.	59.8	77.8	67.3	67.1	61.2	69.7	56.1	69.9	56.9	56.2	68.9	74.2	66.1
Dubuque, Iowa	67.9	66.0	66.5	73.3	75.3	76.3	77.6	72.7	68.0	58.9	59.9	73.4	63.8
Dunith, Minn.	65.4	74.1	72.2	73.2	74.5	75.7	74.8	80.5	77.1	73.3	77.1	72.9	75.0
Eastport, Me.	78.5	71.6	72.4	73.5	74.5	75.7	74.8	80.5	77.1	73.3	77.1	72.9	75.0
Elliot, Fort, Tex.	59.1	58.0	61.1	74.2	53.2	63.8	67.6	65.4	54.0	52.2	65.6	67.5	62.6
El Paso, Tex.	45.9	48.3	52.6	53.6	54.7	58.3	58.7	44.7	31.9	31.9	26.7	34.4	45.8
Erie, Pa.	74.0	68.7	77.3	77.0	71.1	80.4	82.4	83.2	77.0	73.0	67.6	69.4	74.8
Escanaba, Mich.	76.5	74.4	77.3	73.5	74.9	77.2	74.1	72.6	72.0	69.9	68.2	71.9	73.5
Fort Smith, Ark.	74.4	72.1	63.8	78.2	65.8	67.2	69.8	72.7	63.1	66.5	68.6	75.0	69.8
Galveston, Tex.	71.8	69.3	70.0	77.6	74.6	77.5	78.4	79.0	78.4	73.4	78.1	73.7	75.6
Grand Haven, Mich.	78.2	77.9	77.0	76.6	78.1	79.9	77.8	81.4	76.4	64.6	67.9	100.0	75.4
Grant, Fort, Ariz.	51.6	57.8	37.3	41									

	67.2	69.0	70.0	71.5	73.0	73.8	73.3	74.1	70.1	100.5	54.3	08.7	68.1
La Crosse, Wis.	67.2	69.0	70.0	71.5	73.0	73.8	73.3	74.1	70.1	100.5	54.3	08.7	68.1
Leavenworth, Kans.	67.0	67.2	67.2	67.5	73.3	73.3	70.6	64.0	67.3	67.3	64.0	71.7	67.8
Lewiston, Idaho.	73.4	75.6	69.3	78.2	68.8	68.8	69.8	73.4	68.3	70.3	75.4	67.4	73.8
Little Rock, Ark.	72.8	71.1	68.9	69.2	69.5	63.8	61.9	71.1	75.0	70.3	75.4	80.7	70.8
Los Angeles, Cal.	68.8	65.9	65.5	75.9	68.2	72.7	75.4	71.5	68.5	68.4	70.3	75.6	70.7
Louisville, Ky.	69.2	69.0	69.4	72.4	73.1	63.0	62.6	68.4	65.0	66.5	71.3	78.8	68.5
Lynchburg, Va.	74.7	74.3	78.4	73.4	69.7	63.0	62.6	68.4	65.0	66.5	71.3	78.8	70.9
Madison City, Miss.	70.7	71.4	70.2	70.1	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2
Macon, N. C.	70.7	71.4	70.2	70.1	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2
Magnum, Fort, Mont.	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6
Marquette, Mich.	68.1	67.1	67.0	70.2	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6	68.6
Memphis, Tenn.	69.4	72.3	77.9	72.6	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2
Meriden, Conn.	71.7	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5
Midvale, Wis.	71.7	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5
Mobile, Ala.	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1
Monterey, Cal.	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1
Montreal, Minn.	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1
Mountain View, N. H.	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1	68.1
Nashville, Tenn.	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6
New Haven, Conn.	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5
New London, Conn.	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6
New Orleans, La.	70.6	69.3	67.4	67.4	67.4	67.4	67.4	67.4	67.4	67.4	67.4	67.4	67.4
New York City	71.2	72.5	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1
New York City	71.2	72.5	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1
North Platte, Nebr.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Omaha, Neb.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Omaha, Neb.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Owego, N. Y.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Palestine, Texas	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Pensacola, Fla.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Philadelphia, Pa.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Pikes Peak, Colo.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Pittsburg, Pa.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Portland, Me.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Portland, Ore.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Prescott, Ariz.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Provincetown, Mass.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Rio Grande City, Tex.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Rochester, N. Y.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Roseburg, Ore.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Sacramento, Cal.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Saint Louis, Mo.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Saint Louis, N. H., Fort, Alaska.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Saint Paul, Minn.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Saint Vincent, Minn.	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
Salt Lake City, Utah	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2

\* 29 days only.  
 \* 30 days only.  
 \* 25 days only.  
 \* 28 days only.

\* 27 days only.  
 \* Record incomplete.  
 \* 25 days only.

\* Observations discontinued April 1, 1894.  
 \* Observations re-commenced October 1, 1893.  
 \* Observations re-commenced October 10, 1893.



## REPORT OF THE CHIEF SIGNAL OFFICER.

*Monthly and annual mean relative humidity at stations of the Signal Service, United States Army, &c.—Continued.*

[illegible]

<sup>1</sup> Observations re-commenced July 20, 1893.  
<sup>2</sup> 20 days only.  
<sup>3</sup> 50 days only.

Observations commenced October 1, 1933.

**\* 28 days only.**  
**\* No record.**

## APPENDIX 59.

Table showing the mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, deduced from the three telegraphic observations, computed from the commencement of observations at each, to December 31, 1883.

[The daily mean is obtained by dividing the sum of the three telegraphic observations by three; the monthly mean by dividing the sum of the daily means by the number of days in the month.]

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	Dec. 22, 1873	76.7	74.0	71.9	63.4	62.6	63.8	67.8	63.2	72.2	72.8	75.0	75.0	70.7
Alpena, Mich.	Sept. 10, 1872	76.8	74.3	73.8	62.3	62.6	63.8	67.8	63.2	72.2	72.8	75.0	75.0	70.7
Apache, Fort, Ariz.	Oct. 9, 1877	60.2	54.3	53.2	52.4	53.6	52.3	57.2	54.6	50.4	48.7	50.8	50.1	51.8
Arsenal, Fort, Mont.	Oct. 6, 1879	61.5	61.3	59.2	52.4	54.7	50.1	53.9	44.9	56.8	60.6	63.6	62.9	57.9
Atlanta, Ga.	Sept. 25, 1878	73.0	64.1	64.7	62.1	63.0	64.3	68.0	72.5	71.3	71.8	73.5	73.4	70.4
Atlantic City, N. J.	Dec. 10, 1873	80.7	77.0	77.0	70.4	70.1	81.7	83.1	82.2	81.3	78.3	72.3	73.4	78.4
Baltimore, Md.	Nov. 2, 1870	74.3	68.4	69.1	64.8	64.4	63.1	63.7	62.3	72.4	73.9	72.3	73.4	68.4
Barnesville, Ga.	Jan. 1, 1871	70.8	69.3	70.3	60.8	60.4	64.1	64.3	62.7	70.9	68.7	64.5	68.2	68.4
Barnett, Fort, N. J.	Dec. 10, 1873	70.0	64.3	71.9	62.3	60.0	70.3	63.2	64.1	70.7	73.0	70.3	72.1	68.7
Benton, Fort, Ark.	Dec. 22, 1873	72.1	71.3	74.9	62.1	62.1	63.8	67.8	64.5	60.4	64.9	60.4	65.3	60.7
Benton, Fort, Ark.	Oct. 11, 1874	73.4	70.9	72.7	62.1	62.1	63.8	67.8	64.5	60.4	64.9	60.4	65.3	60.7
Bloomington, Ill.	Sept. 16, 1874	73.4	70.9	72.7	62.1	62.1	63.8	67.8	64.5	60.4	64.9	60.4	65.3	60.7
Bloomington, Ill.	Sept. 1, 1880	73.4	70.9	72.7	62.1	62.1	63.8	67.8	64.5	60.4	64.9	60.4	65.3	60.7
Boston, Mass.	July 1, 1877	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Brownsville, Tex.	Aug. 24, 1873	71.8	68.0	68.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Buchanan, N. Y.	Nov. 1, 1870	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Burlington, Vt.	Oct. 26, 1873	72.1	72.1	72.1	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Calcutta, India	Dec. 15, 1873	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Cape Henry, Va.	May 24, 1873	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Cape Mendocino, Cal.	July 27, 1873	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Cedar Key, Fla.	Nov. 27, 1873	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Charleston, S. C.	Jan. 6, 1871	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Charlotte, N. C.	Oct. 6, 1873	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Chattanooga, Tenn.	Jan. 6, 1879	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Chickasaw, Miss.	Nov. 1, 1870	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Chicago, Ill.	Nov. 1, 1870	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Chickasaw, Miss.	Nov. 1, 1870	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Cincinnati, Ohio	Nov. 1, 1870	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Cleveland, Ohio	Nov. 1, 1870	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8
Columbus, Ohio	July 1, 1873	73.0	73.0	73.0	60.8	60.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8



Mackinaw City, Mich.	Aug. 20, 1873	71.0	69.3	64.6	67.7	68.4	73.8	74.7	74.9	73.4	77.2	90.1	72.8
Macon, Fort, N. C.	May 23, 1873	85.3	83.3	75.4	79.8	79.8	82.1	81.6	82.1	84.0	77.2	79.8	81.4
Magnum, N. C.	July 14, 1873	54.1	45.7	46.1	51.7	53.0	44.0	50.6	53.1	50.1	52.6	70.8	70.8
Marquette, Mich.	May 1, 1871	74.0	71.9	71.4	65.8	63.5	67.4	69.8	70.2	70.1	68.4	70.8	68.0
Memphis, Tenn.	Feb. 28, 1871	72.7	67.9	61.8	61.3	63.4	63.4	73.5	74.3	73.8	75.4	78.1	74.3
Milwaukee, Wis.	Nov. 1, 1870	70.4	67.1	70.2	70.1	68.4	71.0	75.0	77.9	74.8	75.4	78.1	74.6
Mobile, Ala.	Nov. 7, 1870	78.0	74.4	73.9	73.5	68.5	68.5	68.5	68.5	68.1	70.7	73.2	68.8
Monterey, Cal.	Nov. 9, 1870	81.7	79.1	78.7	74.2	68.5	72.4	72.4	72.4	71.7	73.7	80.8	75.0
Mount Pleasant, Minn.	Jan. 1, 1870	81.7	79.1	78.7	74.2	68.5	72.4	72.4	72.4	71.7	73.7	80.8	75.0
Mount Washington, N. H.	Dec. 1, 1870	81.7	79.1	78.7	74.2	68.5	72.4	72.4	72.4	71.7	73.7	80.8	75.0
Nashville, Tenn.	Dec. 1, 1870	72.5	68.2	63.8	61.6	61.7	66.2	67.6	68.5	66.6	71.6	72.2	67.3
New Haven, Conn.	Dec. 10, 1872	72.5	68.2	63.8	61.6	61.7	66.2	67.6	68.5	66.6	71.6	72.2	67.3
New London, Conn.	Jan. 10, 1871	73.1	68.3	71.5	65.0	66.4	70.1	73.9	75.4	73.7	71.3	74.4	71.4
New Orleans, La.	Nov. 1, 1870	72.4	68.3	71.5	65.0	66.4	70.1	73.9	75.4	73.7	71.3	74.4	71.4
New York City	Nov. 1, 1870	72.4	68.3	71.5	65.0	66.4	70.1	73.9	75.4	73.7	71.3	74.4	71.4
Norfolk, Va.	Nov. 1, 1871	72.5	68.3	71.5	65.0	66.4	70.1	73.9	75.4	73.7	71.3	74.4	71.4
North Platte, Neb.	Sept. 15, 1874	68.2	64.3	63.1	63.2	64.1	63.2	63.2	63.2	63.2	63.2	63.2	63.2
Olympia, Wash. T.	July 1, 1877	73.2	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
Oman, N. Y.	Nov. 1, 1870	73.2	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
Oswego, N. Y.	Nov. 1, 1870	73.2	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
Palatine, Tex.	Nov. 1, 1870	73.2	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9
Pensacola, Fla.	Oct. 27, 1870	70.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1
Philadelphia, Pa.	Jan. 1, 1871	74.4	68.7	72.6	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Pike's Peak, Colo.	Nov. 1, 1873	75.5	67.3	72.3	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0
Pittsburg, Pa.	Nov. 1, 1870	75.5	67.3	72.3	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0
Port Huron, Mich.	July 25, 1874	80.6	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
Portland, Me.	Jan. 15, 1871	73.4	68.3	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Portland, Ore.	Nov. 1, 1871	73.4	68.3	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Prescott, Ariz.	Nov. 15, 1873	75.2	63.6	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2
Provincetown, Mass.	Nov. 15, 1873	75.2	63.6	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2
Red Bluff, Cal.	Nov. 1, 1877	71.6	68.2	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6
Red Bluff, Tex.	May 28, 1875	74.0	68.2	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0
Rock Grand, Cal.	Nov. 1, 1870	83.3	80.0	73.3	71.3	68.3	62.3	61.3	61.3	61.3	61.3	61.3	61.3
Roseburg, Ore.	July 1, 1877	71.2	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Sacramento, Cal.	Nov. 1, 1877	71.2	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Saint Louis, Mo.	Nov. 28, 1874	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7
Saint Michael's, Fort, Alaska	Nov. 28, 1874	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7
Saint Paul, Minn.	Nov. 1, 1870	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1
Saint Vincent, Minn.	Sept. 15, 1880	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1	94.1
Salt Lake City, Utah	Nov. 1, 1874	59.0	57.0	55.1	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
Salt Lake City, Utah	Nov. 1, 1871	71.2	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Sand Diego, Cal.	Nov. 1, 1871	71.2	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Sandy Hook, N. Y.	Aug. 2, 1873	77.2	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3
Savannah, Ga.	Dec. 1, 1873	72.3	68.0	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3
Shaw, Fort, Mont.	Jan. 1, 1880	72.3	68.0	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3
Shaw, Fort, Mont.	Apr. 1, 1871	72.3	68.0	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3
Silverport, La.	Sept. 1, 1875	65.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
Six Forks, Ind. T.	Mar. 23, 1881	70.0	74.9	69.2	69.2	69.2	69.2	69.2	69.2	69.2	69.2	69.2	69.2
St. Albans, N. C.	Oct. 15, 1875	81.0	74.9	75.5	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0
Smithville, N. C.	Oct. 15, 1875	82.2	77.7	74.2	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6
Spokane, Wash. T.	Nov. 1, 1881	70.8	67.4	63.3	61.4	61.4	61.4	61.4	61.4	61.4	61.4	61.4	61.4
Springfield, Ill.	July 1, 1879	63.3	67.4	63.3	61.4	61.4	61.4	61.4	61.4	61.4	61.4	61.4	61.4

Table showing the mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Stockton, Calif., Tex.	Feb. 24, 1876	54.0	51.9	50.5	45.8	57.3	53.1	51.4	51.9	50.8	58.9	56.9	53.1	54.1
Thomas, Camp, Ariz.	Sept. 22, 1877	60.2	61.5	54.4	37.9	32.9	33.6	50.2	53.6	49.0	47.3	54.2	64.5	51.3
Toledo, Ohio	Nov. 1, 1870	75.4	73.2	69.9	63.7	62.5	67.6	63.5	70.8	71.4	60.5	71.0	74.8	69.8
Unalakleet, Alaska	Aug. 13, 1873	87.1	86.3	84.0	81.9	73.4	75.8	76.7	79.7	81.8	84.8	80.0	81.8	81.6
Vicksburg, Miss.	Sept. 10, 1871	71.4	66.4	64.4	66.3	67.2	70.2	72.0	71.6	73.3	71.6	70.8	70.8	69.5
Washington City	Nov. 1, 1870	73.4	63.3	64.8	62.6	63.5	66.7	63.8	72.2	73.7	71.9	70.6	71.9	68.9
West Las Animas, Colo.	Oct. 1, 1881	63.7	53.2	45.2	44.5	52.4	52.8	47.6	52.8	43.7	52.7	55.9	63.4	53.4
Wilmington, N. C.	Jan. 1, 1871	72.8	60.2	63.1	68.1	70.6	72.7	75.0	73.6	76.5	75.1	72.3	72.7	72.4
Yankton, Dak.	Apr. 1, 1873	66.4	68.5	67.8	64.5	66.6	70.7	70.6	66.6	67.0	64.7	66.0	60.1	67.0
Yuma, Ariz.	Nov. 13, 1873	44.6	42.3	41.6	38.8	33.8	35.8	36.3	43.3	40.3	40.2	33.9	44.6	39.4

# APPENDIX 60.

Monthly and annual mean dew point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for the year ending June 30, 1884.

[Deduced from observations taken at 7 a. m., 8 and 11 p. m., Washington time. The daily means are obtained by dividing the sum of the 7 a. m., 8 and 11 p. m. observations by 3; the monthly means by dividing the sum of the daily means by the number of days in the month.]

Stations.	1883.								1884.				
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Annual mean.
Albany, N. Y.	56.1	54.6	43.5	38.5	32.7	27.4	11.9	22.1	23.5	34.3	44.6	55.0	37.6
Alpena, Mich.	54.7	51.0	43.4	34.9	28.0	16.8	3.6	9.0	10.8	26.3	33.7	42.5	31.6
Apache, Fort, Ariz.	53.5	55.7	41.7	33.2	24.5	13.5	23.7	36.1	33.2	30.7	33.0	41.5	34.1
Ashtabula, Fort, Mont.	42.3	44.9	33.9	27.8	15.2	12.5	6.6	0.7	16.9	28.9	33.7	48.2	23.5
Atlanta, Ga.	63.8	63.8	53.3	55.6	39.9	30.3	23.4	37.5	41.2	41.8	54.7	61.5	43.4
Atlantic City, N. J.	63.4	62.2	57.3	48.4	34.8	30.3	22.3	32.6	33.1	39.1	50.0	60.4	44.8
Augusta, Ga.	68.9	67.2	64.9	47.7	44.8	42.5	32.6	43.9	40.3	36.4	43.5	64.8	53.6
Baltimore, Md.	54.3	54.8	54.8	47.7	36.8	28.5	21.5	31.9	32.9	36.4	43.5	60.0	43.4
Barnegat City, N. J.	66.6	62.4	57.8	48.4	38.0	30.0	22.6	34.3	32.6	37.7	49.9	58.6	44.9
Behring's Island, Behring Sea	43.4	50.0	41.6	33.3	27.3	24.2	21.7	24.8	23.1	27.9	33.8	37.8	32.5
Benton, Fort, Dak.	56.9	54.8	43.2	32.1	17.6	12.4	6.7	0.7	20.9	31.2	42.9	50.3	31.6
Benton, Fort, Mont.	44.7	44.5	39.3	27.7	11.6	9.1	6.0	4.3	27.8	27.9	39.7	49.1	27.6
Blancard, Dak.	52.5	52.8	41.0	33.8	20.4	4.7	0.5	3.5	14.1	23.9	42.6	50.4	23.0
Block Island, R. I.	63.9	60.3	54.4	45.7	39.6	29.5	24.2	31.2	30.1	33.1	48.1	57.1	37.6
Boise City, Idaho	(C)	(C)	(C)	37.2	31.7	25.3	22.9	24.6	33.4	38.0	43.8	52.5	33.3
Boston, Mass.	60.7	53.1	43.9	40.6	33.1	23.3	16.1	27.0	26.8	37.2	45.7	56.8	34.5
Brownsville, Tex.	74.4	73.2	70.2	70.7	62.5	56.6	43.5	56.4	62.1	62.7	69.4	72.3	64.5
Buffalo, N. Y.	58.9	56.7	43.7	39.9	32.7	23.9	14.0	22.0	23.4	32.2	43.8	55.6	37.6
Burford, Fort, Dak.	50.1	51.9	33.4	31.9	15.8	6.5	3.2	5.1	14.9	29.3	39.7	52.8	27.4
Cairo, Ill.	64.3	64.3	53.2	53.2	39.3	32.5	21.3	34.4	38.7	43.7	55.3	67.7	47.8
Canby, Fort, Wash. T.	(C)	(C)	47.1	44.6	40.2	37.1	29.8	33.2	39.0	45.8	47.4	51.2	50.4
Cape Henry, Va.	67.7	64.9	63.1	54.8	42.0	37.2	29.8	41.1	40.5	43.9	53.1	63.8	43.8
Cape May, N. J.	57.2	53.1	33.5	43.9	39.9	33.9	23.0	35.0	35.0	41.6	51.6	60.9	43.6
Cape Mendocino, Cal.	74.4	74.3	51.0	48.4	43.6	43.3	41.5	38.8	41.1	44.1	47.3	50.3	63.4
Cedar Key, Fla.	74.4	74.3	70.2	69.6	57.8	57.7	43.5	56.3	56.6	53.7	67.1	69.2	63.4
Charleston, S. C.	76.7	73.7	69.4	64.7	51.0	48.7	33.3	50.9	49.2	52.2	46.5	62.9	52.5
Charlotte, N. C.	64.6	61.3	53.9	53.9	38.2	35.3	23.3	40.9	41.0	41.0	53.4	61.5	43.5

Record incomplete.  
 \* Twenty-eight days only.

\* Twenty-six days only.

\* Observations commenced Sept. 1, 1883.

\* Twenty-nine days only.

*Monthly and annual mean dew point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.*

Stations.	1883.							1884.							Annual mean.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.			
Chattanooga, Tenn.	64.5	65.0	60.1	57.4	59.3	58.5	52.3	50.2	40.8	44.9	55.3	64.3	49.3		
Cheyenne, Wyo.	41.9	43.3	29.0	22.4	12.6	14.4	11.0	10.5	16.0	22.8	32.8	42.0	25.1		
Chicago, Ill.	60.0	56.8	49.7	42.2	30.5	21.5	18.9	18.9	24.4	32.8	44.4	55.8	37.3		
Cincinnati, Va.	63.5	64.9	61.7	52.5	41.3	34.1	27.0	27.0	36.8	41.0	53.9	62.9	43.7		
Cincinnati, Ohio.	62.8	58.2	53.3	48.0	38.0	32.3	29.0	29.0	34.7	41.2	51.0	62.9	44.9		
Cleveland, Ohio.	58.7	54.2	47.8	40.9	31.1	24.8	13.9	25.5	26.6	32.9	45.7	57.2	38.3		
Columbus, Ohio.	60.1	54.9	50.2	45.1	32.3	25.7	14.0	20.5	29.2	37.5	48.3	59.7	40.5		
Columbus, Tex.	59.0	61.0	59.0	58.2	42.9	38.0	28.4	28.4	38.8	43.4	54.7	64.3	48.9		
Custer, Fort, Mont.	59.9	45.7	41.5	32.6	11.2	17.9	8.7	1.7	20.3	30.4	41.2	54.1	38.1		
Davenport, Iowa.	62.8	58.4	48.7	41.1	30.4	20.1	17.2	18.1	24.9	34.5	47.9	60.6	38.9		
Dayton, Fort, Tex.	55.0	57.0	48.9	44.0	33.5	23.7	22.3	22.3	32.4	34.4	42.9	50.7	36.0		
Dayton, Wash. T.	43.6	46.1	44.3	38.9	34.1	27.9	25.1	18.0	31.8	37.3	45.4	49.2	32.2		
Deadwood, Dak.	52.8	52.1	40.3	33.4	24.4	17.8	14.4	9.0	20.9	23.5	38.2	51.0	32.2		
Delaware Breakwater, Del.	66.7	64.5	61.2	51.7	40.5	32.8	25.8	35.7	35.2	37.9	51.1	61.4	47.2		
Denver, Colo.	48.4	47.5	38.0	29.3	20.7	19.4	15.3	14.3	22.1	30.1	37.2	47.2	30.5		
Des Moines, Iowa.	62.8	59.1	47.1	40.0	24.8	17.0	6.4	11.5	27.5	32.5	44.5	60.1	34.3		
Dodge City, Kans.	58.9	63.6	51.6	40.1	27.4	24.7	13.0	18.4	26.2	31.9	46.8	61.6	38.1		
Dubuque, Iowa.	60.5	55.5	46.3	37.4	26.0	14.7	0.9	12.0	31.0	32.6	43.9	59.0	34.7		
Duluth, Minn.	52.8	58.8	45.8	35.6	22.6	9.2	0.6	6.2	13.3	27.5	36.9	50.8	28.0		
Eastport, Me.	52.0	52.2	45.9	36.1	31.2	18.8	11.0	18.5	21.2	34.0	54.8	68.0	34.0		
Elliot, Fort, Tex.	56.7	56.8	50.7	45.6	28.1	26.6	18.3	22.5	23.5	31.6	47.1	62.3	36.4		
El Paso, Tex.	56.1	54.5	49.9	41.4	31.5	29.4	16.1	24.7	24.4	33.8	45.4	48.4	36.4		
El Paso, Pa.	60.0	56.2	49.8	44.8	34.5	24.1	2.0	2.9	13.8	23.7	38.2	57.3	39.9		
Genoa, Mich.	58.9	52.9	45.6	35.1	25.3	14.1	2.0	8.1	18.8	28.2	44.5	52.9	38.9		
Fort Smith, Ark.	69.9	66.2	55.0	45.0	35.0	22.6	10.3	21.0	33.2	44.5	56.2	68.8	48.3		
Galveston, Tex.	73.5	73.0	68.2	62.1	55.2	52.6	40.3	43.1	57.3	59.8	68.1	71.9	61.9		
Grand Haven, Mich.	60.2	57.1	49.5	40.0	34.3	25.1	15.1	19.9	25.5	31.8	43				

Key West, Fla.	72.4	72.9	74.0	72.7	68.1	64.5	61.3	64.1	65.3	164.7	98.7	72.5	68.7	68.7
Kitty Hawk, N. C.	68.9	67.7	65.0	57.7	44.0	33.9	22.0	43.2	41.3	42.5	56.7	64.7	56.7	51.9
Knoxville, Tenn.	63.8	62.1	60.8	56.8	37.0	33.5	23.6	47.9	38.8	41.7	53.7	62.4	41.7	47.3
La Crosse, Wis.	60.2	55.6	47.1	35.7	28.2	16.9	4.3	11.0	30.3	18.1	42.6	51.6	38.4	34.4
Leavenworth, Kans.	64.6	62.3	61.0	43.7	30.7	24.2	12.4	17.2	30.1	39.1	45.6	61.6	40.4	40.4
Lewiston, Idaho.	42.2	41.4	41.4	35.9	32.8	28.8	22.0	18.8	32.6	43.0	44.9	55.6	36.8	36.8
Little Rock, Ark.	71.0	67.9	58.7	55.8	44.1	38.3	26.0	38.7	41.2	48.8	56.9	68.9	51.9	49.8
Los Angeles, Cal.	59.3	56.6	57.4	49.4	41.9	42.1	38.4	44.0	46.4	50.1	53.3	56.7	46.8	46.8
Louisville, Ky.	65.1	63.0	54.3	50.4	38.4	32.6	20.5	34.7	35.2	41.8	57.2	65.8	46.3	45.3
Lynchburg, Va.	63.0	58.4	55.3	49.5	33.9	20.3	7.8	7.3	16.2	27.8	38.8	53.1	32.5	32.5
Macon, Ga.	72.7	70.9	67.8	60.5	47.8	42.8	34.9	45.0	46.6	48.5	62.6	67.8	55.9	55.9
Madison, Wis.	63.6	63.3	44.5	35.9	29.5	20.3	5.3	4.8	9.6	18.1	31.7	40.7	21.0	21.0
Maginnia, Fort. Mont.	35.6	35.7	32.3	32.3	24.7	12.7	0.1	1.9	12.9	25.4	35.9	47.1	37.9	37.9
Marquette, Mich.	50.9	49.9	42.7	38.3	42.9	19.5	7.6	17.3	38.4	43.6	57.3	67.2	50.5	50.5
Memphis, Tenn.	69.2	66.4	57.0	58.4	28.9	18.5	8.5	4.8	52.8	54.8	64.9	69.0	57.9	57.9
Milwaukee, Wis.	57.4	55.8	48.8	40.1	43.7	48.0	35.4	48.2	47.5	46.2	56.7	65.6	53.7	53.7
Mobile, Ala.	72.6	71.4	65.7	63.9	45.1	43.7	22.5	43.8	47.5	46.2	56.7	65.6	53.7	53.7
Montgomery, Ala.	68.3	68.5	61.0	58.5	46.1	43.7	22.5	43.8	47.5	46.2	56.7	65.6	53.7	53.7
Moorehead, Minn.	54.7	51.9	43.8	32.7	16.5	16.7	2.2	10.9	8.6	22.3	30.4	41.7	24.9	24.9
Mount Washington, N. H.	44.8	41.6	31.4	27.1	16.5	16.7	2.2	10.9	8.6	22.3	30.4	41.7	24.9	24.9
Nashville, Tenn.	67.7	65.2	58.2	56.6	42.8	36.7	24.7	38.0	39.5	45.5	55.2	63.2	46.6	46.6
New Haven, Conn.	60.6	56.8	51.0	39.9	32.3	22.6	15.6	26.4	25.3	34.5	44.6	55.8	38.8	38.8
New London, Conn.	62.8	58.6	53.5	43.6	36.8	24.0	19.1	28.7	28.9	38.3	45.2	56.9	41.1	41.1
New Orleans, La.	72.3	71.3	66.0	66.3	51.7	50.0	37.7	50.0	54.3	56.6	66.0	69.2	56.4	56.4
New York City	62.0	56.0	52.7	42.9	34.7	25.0	20.1	26.3	29.3	36.3	47.3	57.5	41.2	41.2
Norfolk, Va.	68.6	66.2	63.1	55.3	42.2	38.9	29.6	42.5	41.4	42.3	55.4	63.9	50.6	50.6
North Platte, Nebr.	58.0	56.2	53.3	48.7	41.0	35.3	34.2	28.5	30.8	44.1	45.9	50.0	43.0	43.0
Olympia, Wash. T.	45.4	48.6	50.1	48.7	41.0	35.3	34.2	28.5	30.8	44.1	45.9	50.0	43.0	43.0
Omaha, Nebr.	63.4	62.7	51.3	41.6	29.8	18.0	9.5	11.5	27.1	38.3	50.6	63.3	37.2	37.2
Owego, N. Y.	58.3	56.0	48.7	39.1	31.4	20.8	11.4	21.8	24.5	32.9	44.7	56.4	54.4	54.4
Palestine, Tex.	70.7	66.7	59.3	50.8	48.5	42.8	36.5	50.5	55.1	56.0	69.1	69.1	59.0	59.0
Pennscola, Fla.	73.5	72.8	66.5	64.2	48.2	49.3	36.5	50.5	55.1	56.0	69.1	69.1	59.0	59.0
Philadelphia, Pa.	69.3	66.2	59.2	48.8	38.8	30.7	21.9	34.2	34.9	42.8	57.2	61.3	47.3	47.3
Pike's Peak, Colo.	58.9	56.3	52.9	42.2	34.7	25.0	20.1	26.3	29.3	36.3	47.3	57.5	41.2	41.2
Pittsburg, Pa.	61.7	57.6	51.3	45.8	36.4	31.0	19.8	32.7	32.1	36.5	49.4	60.8	43.0	43.0
Port Huron, Mich.	58.6	56.6	48.6	39.4	32.0	21.5	10.5	18.9	22.3	31.3	43.6	55.6	36.7	36.7
Portland, Me.	59.2	55.5	48.5	37.8	32.3	20.1	15.3	23.0	22.6	31.6	41.4	54.1	37.2	37.2
Portland, Ore.	52.7	52.8	50.5	44.6	42.5	36.8	31.8	30.4	27.0	32.7	44.2	54.1	43.2	43.2
Portland, Ariz.	52.2	53.8	36.1	31.0	23.1	28.3	22.4	28.7	31.8	42.1	50.9	60.9	34.8	34.8
Prescott, Ariz.	60.4	57.9	52.3	41.4	36.6	27.3	22.3	28.7	31.8	42.1	50.9	60.9	34.8	34.8
Provincetown, Mass.	50.0	45.2	43.8	42.3	39.7	37.6	34.5	30.1	28.0	32.7	44.2	54.1	43.2	43.2
Red Bluff, Cal.	48.4	49.5	45.1	43.1	40.1	35.6	31.5	23.3	22.3	31.3	43.6	55.6	36.7	36.7
Rio Grande City, Tex.	68.9	67.1	53.0	43.1	40.1	35.6	31.5	23.3	22.3	31.3	43.6	55.6	36.7	36.7
Rochester, N. Y.	58.3	54.4	45.6	45.0	43.4	40.1	35.6	31.5	23.3	22.3	31.3	43.6	36.7	36.7
Roseburg, Ore.	65.9	63.7	53.6	45.4	43.4	40.1	35.6	31.5	23.3	22.3	31.3	43.6	36.7	36.7
Sacramento, Cal.	65.9	63.7	53.6	45.4	43.4	40.1	35.6	31.5	23.3	22.3	31.3	43.6	36.7	36.7
Saint Louis, Mo.	65.9	63.7	53.6	45.4	43.4	40.1	35.6	31.5	23.3	22.3	31.3	43.6	36.7	36.7
Saint Michael's, Fort. Alaska.	47.5	45.7	40.6	39.3	10.9	2.8	2.4	10.1	13.2	20.3	30.7	40.6	24.5	24.5

<sup>1</sup> 29 days only.  
<sup>2</sup> 20 days only.  
<sup>3</sup> Observations re-commenced July 31, 1883.  
<sup>4</sup> 27 days only.

<sup>5</sup> Observations re-commenced October 1, 1883.  
<sup>6</sup> Observations discontinued April 1, 1884.  
<sup>7</sup> Record incomplete.

<sup>8</sup> Observations re-commenced October 10, 1883.  
<sup>9</sup> Observations discontinued April 1, 1884.  
<sup>10</sup> Record incomplete.



Monthly and annual mean dew-point (in degree Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	1882.						1884.						Annual mean.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Saint Paul, Minn.	56.0	55.4	45.9	34.8	21.5	10.4	9.0	9.4	17.8	32.8	47.4	50.0	33.1
Saint Vincent, Minn.	52.8	54.2	43.8	32.4	21.3	2.4	10.6	13.1	17.8	25.0	41.6	50.8	28.4
Salt Lake City, Utah	42.1	43.6	30.8	21.4	14.1	19.8	14.7	17.9	27.0	31.4	41.6	41.0	31.1
San Diego, Cal.	56.9	56.8	50.9	51.4	34.4	24.7	40.4	43.9	38.3	31.0	54.9	57.1	51.4
Sanitary, Ohio	(1)	57.5	51.8	44.0	34.4	24.7	12.4	23.7	28.7	33.8	47.7	50.2	43.9
Sandy Hook, N. J.	53.8	50.5	54.9	45.5	37.8	27.7	19.0	30.5	30.6	33.8	48.1	57.8	48.0
Sanford, Fla.	73.0	72.1	69.0	68.8	59.7	54.2	48.3	50.8	53.6	57.5	60.7	59.0	52.7
San Francisco, Cal.	52.4	52.6	53.7	50.4	47.3	44.3	44.5	42.5	47.1	48.4	50.2	50.2	48.9
Savannah, Ga.	71.1	71.0	66.0	61.4	47.8	44.0	38.2	47.7	48.2	49.6	52.8	50.7	48.0
Shaw, Fort, Mont.	66.1	68.8	58.7	58.7	48.2	40.7	28.7	43.1	44.1	50.4	53.8	53.7	50.2
Shreveport, La.	70.1	70.1	63.8	60.2	44.0	40.7	28.7	43.1	44.1	50.4	53.8	53.7	50.2
Sitka, Alaska	47.8	48.8	46.8	38.0	23.9	23.8	30.6	48.9	43.0	50.0	54.0	50.3	38.5
Smithville, N. C.	71.9	69.5	63.6	52.9	43.2	44.2	38.5	48.9	43.0	50.0	54.0	50.3	38.5
Spokane Falls, Wash. T.	63.8	64.1	63.4	54.7	52.5	51.9	18.3	34.8	30.8	38.3	48.3	50.2	40.8
Springfield, Ill.	63.9	64.1	63.4	54.7	52.5	51.9	18.3	34.8	30.8	38.3	48.3	50.2	40.8
Stockton, Cal.	63.9	64.1	63.4	54.7	52.5	51.9	18.3	34.8	30.8	38.3	48.3	50.2	40.8
Stockton, Ark. Tex.	63.9	64.1	63.4	54.7	52.5	51.9	18.3	34.8	30.8	38.3	48.3	50.2	40.8
Tacooah Island, Wash. T.	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Thomas, Camp, Ariz.	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Toledo, Ohio	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Unalakleet, Alaska	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Vicksburg, Miss.	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Washington City	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
West Las Animas, Colo.	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Wilmington, N. O.	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Yakutsk, Alaska	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4
Yuma, Ariz.	54.7	54.7	57.0	44.2	33.5	33.9	23.7	32.9	33.7	37.8	48.5	51.3	43.4

1. Observations recommenced July 30, 1884.  
 2. 47 days only.  
 3. 56 days only.  
 4. 56 days only.  
 5. Observations commenced October 1, 1884.  
 6. 23 days only.  
 7. No record.

*Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, computed from January 1, 1882, to December 31, 1883.*

[The daily mean is obtained by dividing the sum of the three telegraphic observations by three; the monthly mean by dividing the sum of the daily means by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	15.8	20.0	22.0	30.4	40.6	55.5	59.2	55.2	51.4	42.0	30.9	21.4	37.1
Albany, Mich.	11.1	15.2	16.0	26.0	33.5	48.4	54.2	55.8	43.1	32.7	20.0	13.1	23.0
Albany, N. Y.	23.2	24.6	31.4	26.7	31.1	38.8	53.8	54.7	42.3	30.1	20.0	26.3	34.2
Albany, Fort, Mont.	-0.2	4.2	15.6	26.6	35.0	44.2	43.8	44.1	37.3	29.2	15.8	11.6	25.6
Albany, N. Y.	23.1	41.4	39.6	30.0	32.8	44.6	64.4	65.6	60.3	55.6	39.2	32.4	50.4
Albany, N. Y.	24.7	39.5	39.8	30.4	35.4	60.5	65.8	64.4	60.3	57.0	34.5	23.0	44.9
Albany, N. Y.	41.6	45.1	42.6	32.8	45.4	67.8	68.2	68.4	63.0	67.0	48.4	37.2	54.1
Albany, N. Y.	26.8	39.4	38.9	33.0	45.0	60.5	63.1	61.6	60.1	50.4	36.9	23.6	43.8
Albany, N. Y.	26.5	39.7	38.9	33.0	45.0	60.5	63.1	61.6	60.1	50.4	36.9	23.6	44.9
Albany, N. Y.	4.7	12.2	21.8	37.6	37.2	55.2	57.8	57.4	45.0	34.8	20.6	11.6	32.3
Albany, N. Y.	5.4	9.6	19.0	37.6	37.2	55.2	57.8	57.4	45.0	34.8	20.6	11.6	32.3
Albany, N. Y.	1.2	7.8	15.0	30.2	34.2	52.1	54.0	46.8	43.6	34.4	21.0	6.0	29.5
Albany, N. Y.	1.3	25.8	26.4	35.4	44.7	58.0	63.4	61.4	57.2	48.3	37.0	23.4	42.4
Albany, N. Y.	18.2	20.6	22.7	31.6	41.7	55.4	59.2	55.9	52.4	43.0	30.9	23.6	37.8
Albany, N. Y.	58.8	57.6	62.8	67.2	70.6	75.0	73.2	73.2	68.2	68.6	60.4	54.6	65.8
Albany, N. Y.	13.2	22.0	31.4	31.4	38.6	53.6	58.4	57.5	50.3	32.4	18.6	7.2	37.7
Albany, N. Y.	3.6	4.8	15.2	30.0	37.8	51.2	52.1	52.8	40.2	32.4	18.6	7.2	28.4
Albany, N. Y.	26.8	35.5	35.2	47.8	53.8	64.8	67.0	65.8	59.1	54.8	39.9	31.3	49.2
Albany, N. Y.	34.2	37.9	35.2	45.2	52.8	61.4	63.2	63.0	54.5	57.4	41.4	34.4	50.4
Albany, N. Y.	23.6	32.4	32.4	41.6	45.6	61.4	67.0	64.6	50.6	47.6	38.4	34.4	47.0
Albany, N. Y.	33.7	34.4	44.3	42.4	45.6	61.4	67.0	64.6	50.6	47.6	38.4	34.4	45.0
Albany, N. Y.	58.8	54.9	54.0	62.8	63.4	72.2	72.2	72.2	68.2	67.4	56.0	52.4	62.8
Albany, N. Y.	47.4	49.6	48.2	53.2	51.7	62.6	63.8	63.6	59.7	53.8	39.7	32.0	50.0
Albany, N. Y.	34.0	39.0	35.4	47.4	48.6	65.1	65.1	64.0	60.8	57.0	49.1	32.0	48.4
Albany, N. Y.	33.8	39.2	37.8	48.6	50.0	65.1	65.1	64.0	60.8	57.0	49.1	32.0	48.4
Albany, N. Y.	6.2	8.6	13.4	21.4	30.6	45.0	40.6	40.6	36.8	22.0	11.0	12.0	23.0
Albany, N. Y.	15.4	22.5	25.5	35.0	41.8	55.4	58.5	60.4	52.3	45.4	32.8	31.6	38.8
Albany, N. Y.	30.7	33.6	33.0	41.6	51.4	64.8	63.0	60.4	55.2	45.4	32.8	31.6	48.2
Albany, N. Y.	27.9	34.1	32.9	42.0	48.0	61.2	62.0	61.2	55.6	51.0	37.7	29.9	45.4
Albany, N. Y.	13.9	25.0	26.0	32.2	41.6	53.0	53.0	57.6	43.3	46.7	31.4	23.4	38.6
Albany, N. Y.	21.6	28.4	27.8	37.0	45.6	53.0	59.0	58.4	53.2	46.7	32.4	24.1	41.0



Michigan	41.1	6.5	7.5	25.5	35.5	49.0	53.2	58.2	62.4	66.6	70.8	75.0	79.2	83.4	87.6	91.8	96.0	100.0
Ill.	40.8	6.4	7.4	25.2	35.2	48.7	52.9	57.1	61.3	65.5	69.7	73.9	78.1	82.3	86.5	90.7	94.9	99.1
Ind.	40.5	6.3	7.3	24.9	34.9	48.4	52.6	56.8	61.0	65.2	69.4	73.6	77.8	82.0	86.2	90.4	94.6	98.8
Pa.	40.2	6.2	7.2	24.6	34.6	48.1	52.3	56.5	60.7	64.9	69.1	73.3	77.5	81.7	85.9	90.1	94.3	98.5
N.Y.	39.9	6.1	7.1	24.3	34.3	47.8	52.0	56.2	60.4	64.6	68.8	73.0	77.2	81.4	85.6	89.8	94.0	98.2
Ohio	39.6	6.0	7.0	24.0	34.0	47.5	51.7	55.9	60.1	64.3	68.5	72.7	76.9	81.1	85.3	89.5	93.7	97.9
Cal.	39.3	5.9	6.9	23.7	33.7	47.2	51.4	55.6	59.8	64.0	68.2	72.4	76.6	80.8	85.0	89.2	93.4	97.6
Tex.	39.0	5.8	6.8	23.4	33.4	46.9	51.1	55.3	59.5	63.7	67.9	72.1	76.3	80.5	84.7	88.9	93.1	97.3
Wis.	38.7	5.7	6.7	23.1	33.1	46.6	50.8	55.0	59.2	63.4	67.6	71.8	76.0	80.2	84.4	88.6	92.8	97.0
Mo.	38.4	5.6	6.6	22.8	32.8	46.3	50.5	54.7	58.9	63.1	67.3	71.5	75.7	79.9	84.1	88.3	92.5	96.7
Ill.	38.1	5.5	6.5	22.5	32.5	46.0	50.2	54.4	58.6	62.8	67.0	71.2	75.4	79.6	83.8	88.0	92.2	96.4
Ind.	37.8	5.4	6.4	22.2	32.2	45.7	49.9	54.1	58.3	62.5	66.7	70.9	75.1	79.3	83.5	87.7	91.9	96.1
Pa.	37.5	5.3	6.3	21.9	31.9	45.4	49.6	53.8	58.0	62.2	66.4	70.6	74.8	79.0	83.2	87.4	91.6	95.8
N.Y.	37.2	5.2	6.2	21.6	31.6	45.1	49.3	53.5	57.7	61.9	66.1	70.3	74.5	78.7	82.9	87.1	91.3	95.5
Ohio	36.9	5.1	6.1	21.3	31.3	44.8	49.0	53.2	57.4	61.6	65.8	69.9	74.1	78.3	82.5	86.7	90.9	95.1
Cal.	36.6	5.0	6.0	21.0	31.0	44.5	48.7	52.9	57.1	61.3	65.5	69.7	73.9	78.1	82.3	86.5	90.7	94.9
Tex.	36.3	4.9	5.9	20.7	30.7	44.2	48.4	52.6	56.8	61.0	65.2	69.4	73.6	77.8	82.0	86.2	90.4	94.6
Wis.	36.0	4.8	5.8	20.4	30.4	43.9	48.1	52.3	56.5	60.7	64.9	69.1	73.3	77.5	81.7	85.9	90.1	94.3
Mo.	35.7	4.7	5.7	20.1	30.1	43.6	47.8	52.0	56.2	60.4	64.6	68.8	73.0	77.2	81.4	85.6	89.8	94.0
Ill.	35.4	4.6	5.6	19.8	29.8	43.3	47.5	51.7	55.9	60.1	64.3	68.5	72.7	76.9	81.1	85.3	89.5	93.7
Ind.	35.1	4.5	5.5	19.5	29.5	43.0	47.2	51.4	55.6	59.8	64.0	68.2	72.4	76.6	80.8	85.0	89.2	93.4
Pa.	34.8	4.4	5.4	19.2	29.2	42.7	46.9	51.1	55.3	59.5	63.7	67.9	72.1	76.3	80.5	84.7	88.9	93.1
N.Y.	34.5	4.3	5.3	18.9	28.9	42.4	46.6	50.8	55.0	59.2	63.4	67.6	71.8	76.0	80.2	84.4	88.6	92.8
Ohio	34.2	4.2	5.2	18.6	28.6	42.1	46.3	50.5	54.7	58.9	63.1	67.3	71.5	75.7	79.9	84.1	88.3	

*Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.*

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Stockton, Fort, Tex.....	30.9	33.4	41.3	39.4	34.4	32.6	32.4	30.4	26.0	22.4	23.4	21.3	47.0
Thomas, Camp, Ariz.....	30.8	31.6	37.7	29.3	35.2	44.0	53.4	60.7	47.4	32.8	23.0	22.0	39.5
Toledo, Ohio.....	18.8	24.4	24.2	32.6	42.4	53.8	58.4	58.8	52.6	44.2	31.6	22.0	39.2
Vicksburg, Miss.....	42.3	45.4	46.6	55.6	58.8	60.6	70.4	68.9	62.6	61.2	47.6	41.3	58.0
Washington, City.....	25.8	30.4	29.8	40.7	49.2	61.4	64.0	62.2	53.4	51.1	35.6	27.3	44.6
West Las Animas, Colo.....	7.8	11.4	17.6	23.0	35.2	47.6	49.5	54.6	40.6	31.0	15.2	14.0	23.6
Wilmington, N. C.....	41.0	44.2	43.4	58.0	57.6	68.0	71.4	70.9	63.4	59.4	43.2	26.9	54.6
Yankton, Dak.....	4.8	18.7	21.2	24.8	42.1	53.2	59.1	60.2	48.8	38.0	24.2	12.1	35.0
Yuma, Ariz.....	22.6	23.8	41.0	38.8	39.3	53.0	63.8	66.3	54.8	47.0	32.4	21.3	42.9

## APPENDIX 62.

Table showing the average movement of the wind, in miles, at the stations of the Signal Service, United States Army, for each month and the year.

[Computed from the commencement of observations at each, to and including December, 1883.]

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	Dec. 22, 1873	5,905.7	5,783.8	5,708.6	5,140.9	5,261.1	5,274.6	5,792.5	5,306.9	5,000.6	4,411.6	5,176.0	5,180.0	59,807.3
Alpena, Mich.	Sept. 10, 1872	6,884.6	6,898.6	7,726.6	6,946.0	6,261.1	7,068.5	5,792.5	5,242.8	5,000.6	4,411.6	5,176.0	5,180.0	77,092.9
Apache, Fort, Ariz.	Oct. 9, 1879	3,704.4	3,730.2	4,863.4	5,900.4	5,911.2	5,682.2	4,629.8	5,860.2	4,008.0	4,262.8	3,047.8	3,077.0	97,006.7
Asinabolas, Fort, Mont.	Oct. 6, 1879	7,919.7	8,290.7	7,531.3	7,923.0	7,058.0	6,961.0	7,631.0	6,820.3	6,356.0	7,189.3	8,285.2	8,172.0	87,850.5
Atlanta, Ga.	Sept. 25, 1878	7,603.6	7,647.6	8,292.6	6,449.6	5,912.4	5,873.8	5,407.6	5,869.6	5,514.6	6,484.0	7,789.0	7,226.0	78,148.0
Atlantic City, N. J.	Dec. 10, 1873	7,282.4	7,825.2	8,912.9	8,436.0	7,503.0	8,298.2	5,691.8	6,901.8	7,463.1	7,102.7	7,018.1	7,167.7	86,835.1
Augusta, Ga.	Nov. 2, 1870	2,586.2	2,921.8	3,483.8	3,230.1	2,008.8	2,774.7	4,427.2	2,670.0	2,778.8	2,694.9	2,065.6	2,486.1	83,222.2
Baltimore, Md.	Jan. 1, 1871	4,126.0	4,116.2	4,217.5	4,331.4	4,476.7	4,310.1	4,457.2	3,674.0	3,778.8	3,944.6	3,986.3	4,237.5	51,156.5
Barnegat City, N. J.	Dec. 10, 1873	7,783.1	9,383.6	11,217.5	9,822.1	8,797.7	7,656.0	7,161.4	7,948.8	8,914.7	5,778.0	9,786.7	9,716.5	109,838.9
Barnegat, Fort, Dak.	Dec. 22, 1879	5,722.0	4,292.7	5,904.7	5,608.7	6,387.0	5,923.3	5,535.0	4,488.5	5,090.3	5,778.0	9,786.7	9,716.5	64,436.5
Benton, Fort, Mont.	Oct. 11, 1870	6,054.1	6,841.1	7,190.1	8,246.4	8,031.8	7,762.1	4,791.0	4,235.0	4,813.8	5,094.5	5,153.0	5,845.8	52,870.0
Bismarck, Dak.	Sept. 15, 1874	7,054.7	8,935.3	9,453.3	5,367.0	5,917.5	5,263.5	4,791.0	4,446.2	4,547.4	7,138.3	6,501.3	6,968.3	82,010.7
Black Island, R. I.	Sept. 1, 1877	12,725.7	11,148.0	13,280.0	10,980.0	10,371.8	8,871.3	8,380.7	7,776.7	7,250.9	11,179.8	12,811.0	12,866.8	180,024.7
Boise City, Idaho	July 1, 1877	3,316.0	3,335.2	4,090.5	4,243.7	4,483.8	5,508.3	5,820.6	5,825.9	5,068.0	5,522.4	7,289.2	7,119.2	81,024.4
Boston, Mass.	Nov. 1, 1870	7,258.8	7,173.7	8,418.4	7,216.4	6,463.4	5,545.7	5,441.3	3,755.0	3,126.6	3,891.0	4,967.6	5,177.0	90,111.7
Brownsville, Tex.	Aug. 25, 1875	5,190.0	5,068.7	6,063.6	6,276.9	6,986.9	5,289.1	5,852.2	4,832.1	5,081.2	6,076.3	7,703.0	8,889.2	79,663.9
Buffalo, N. Y.	Nov. 1, 1870	4,650.2	4,334.8	5,069.6	7,254.4	6,412.5	6,042.6	4,482.2	5,823.0	4,188.7	4,978.2	6,054.8	6,007.8	73,082.5
Buffalo, Fort, Dak.	Oct. 22, 1879	5,370.0	5,747.2	6,417.2	6,112.5	5,512.8	7,114.0	3,981.0	3,968.9	5,070.1	9,674.6	9,877.1	9,914.9	109,948.9
Calro, Ill.	Dec. 15, 1873	10,917.8	10,912.0	12,253.8	10,517.9	9,326.1	7,998.5	7,239.2	7,201.8	8,443.7	10,168.9	11,316.2	11,930.8	120,968.8
Cape Henry, Va.	May 24, 1871	6,607.8	6,470.5	6,481.9	6,547.4	6,518.1	5,872.8	6,214.8	5,683.5	5,978.5	6,849.8	6,639.8	6,339.8	81,765.2
Cape May, N. J.	Nov. 7, 1870	6,668.5	6,449.6	6,507.2	6,767.2	6,767.2	7,068.2	6,423.0	5,893.5	5,407.0	6,714.4	5,416.0	5,705.2	70,741.4
Cedar Key, Fla.	Jan. 5, 1871	5,415.4	5,481.6	6,547.4	6,234.8	6,518.1	5,872.8	6,214.8	5,640.5	5,507.0	6,786.6	6,716.0	6,705.2	44,652.6
Charleston, S. C.	Oct. 6, 1878	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	8,872.6	51,115.0
Charleston, N. C.	Jan. 5, 1871	5,415.4	5,481.6	6,547.4	6,234.8	6,518.1	5,872.8	6,214.8	5,640.5	5,507.0	6,786.6	6,716.0	6,705.2	44,652.6
Chattanooga, Tenn.	Jan. 8, 1870	9,524.2	8,807.2	9,767.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	81,115.0
Chattanooga, Wyo.	Nov. 1, 1870	9,524.2	8,807.2	9,767.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	8,807.2	81,115.0
Chicago, Ill.	Jan. 1, 1870	6,600.9	6,170.9	6,312.0	6,948.7	6,421.6	6,638.5	6,515.0	5,897.4	6,200.8	7,401.0	7,907.2	8,355.8	92,252.5
Chicot, Va.	Mar. 16, 1880	8,937.3	9,103.7	11,168.7	10,105.0	9,816.0	7,937.8	7,314.5	7,188.2	5,598.8	6,288.6	6,240.9	6,421.6	102,088.0
Cincinnati, Ohio	Nov. 1, 1870	9,725.9	6,931.6	8,900.8	4,833.4	4,326.9	4,005.2	3,576.4	3,968.8	3,452.4	3,938.6	3,828.2	4,172.8	51,447.4
Cleveland, Ohio	Nov. 1, 1870	7,971.6	6,931.6	8,900.8	4,833.4	4,326.9	4,005.2	3,576.4	3,968.8	3,452.4	3,938.6	3,828.2	4,172.8	63,780.2
Columbia, Ohio	July 1, 1878	5,980.6	6,283.2	7,133.4	6,017.2	6,175.9	5,698.2	4,437.7	5,094.1	4,375.3	7,277.3	8,116.8	8,142.5	80,912.7
Columbia, Tex.	Oct. 10, 1875	6,001.8	7,030.8	8,164.0	6,496.5	6,254.2	5,254.2	4,254.2	3,754.8	4,810.0	7,442.7	8,090.7	6,929.0	80,912.7
Concho, Fort, Mont.	Dec. 6, 1878	6,146.3	6,098.0	7,030.8	6,254.2	5,254.2	4,254.2	3,754.8	4,810.0	7,442.7	8,090.7	6,929.0	6,929.0	64,042.2
Custer, Fort, Mont.	May 24, 1871	6,271.4	7,653.2	8,258.7	6,258.7	6,258.7	6,258.7	6,258.7	6,258.7	6,258.7	6,258.7	6,258.7	6,258.7	86,538.0
Davenport, Iowa	Dec. 24, 1877	4,062.2	3,926.8	4,584.4	5,001.0	4,821.1	5,579.2	5,159.7	5,216.0	4,812.4	5,199.6	4,866.7	4,831.2	72,797.3
Dayton, Wash. T.	July 1, 1879	3,522.7	3,529.7	4,102.0	4,028.3	4,012.0	3,916.3	3,739.7	3,465.0	3,301.3	4,192.3	3,947.0	3,854.8	46,241.3

Table showing the average movement of the wind, in miles, at the stations of the Signal Service, United States Army, for each month and the year—Cont'd.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Deadwood, Dak.	Dec. 25, 1877	Miles. 2,902.7	Miles. 2,878.0	Miles. 2,700.3	Miles. 2,727.0	Miles. 3,036.0	Miles. 3,057.2	Miles. 3,010.8	Miles. 3,366.0	Miles. 3,037.4	Miles. 3,241.4	Miles. 2,591.7	Miles. 2,573.2	Miles. 3,842.8
Delaware, Breakwater, Del.	Jan. 28, 1880	Miles. 1,915.7	Miles. 1,248.8	Miles. 7,119.3	Miles. 11,956.2	Miles. 11,689.2	Miles. 9,557.2	Miles. 8,612.5	Miles. 9,066.8	Miles. 10,964.2	Miles. 12,191.5	Miles. 12,347.5	Miles. 12,502.2	Miles. 13,073.8
Denver, Colo.	Jan. 19, 1871	Miles. 4,768.5	Miles. 4,115.0	Miles. 4,115.0	Miles. 5,287.6	Miles. 5,070.4	Miles. 4,538.1	Miles. 4,632.5	Miles. 4,178.1	Miles. 3,968.0	Miles. 4,436.3	Miles. 4,355.9	Miles. 4,353.8	Miles. 54,957.7
Des Moines, Iowa	Aug. 1, 1878	Miles. 4,677.0	Miles. 4,191.0	Miles. 4,101.8	Miles. 5,016.6	Miles. 5,002.2	Miles. 4,711.6	Miles. 4,783.8	Miles. 4,411.8	Miles. 4,088.8	Miles. 4,356.6	Miles. 4,847.2	Miles. 4,768.2	Miles. 54,618.8
Detroit, Mich.	Nov. 1, 1870	Miles. 4,128.6	Miles. 4,785.2	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Indianapolis, Ind.	Sept. 15, 1874	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Dodge City, Kans.	Sept. 15, 1874	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Dubuque, Iowa	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Duluth, Minn.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Eastport, Me.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Elliot, Fort, Tex.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
El Paso, Tex.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
El Paso, Tex.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Esanaba, Mich.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Fort Smith, Ark.	May 24, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Galveston, Tex.	June 1, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Grand Haven, Mich.	Apr. 19, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Grant, Fort, Ariz.	May 24, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Hatteras, N. C.	Nov. 1, 1875	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Holmes, Mont.	Dec. 1, 1880	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Helena, Mont.	Oct. 16, 1879	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Harmon, Dak.	July 1, 1881	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Indianapolis, Ind.	July 1, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Indianapolis, Ind.	Feb. 10, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Indianapolis, Ind.	May 1, 1872	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Jacksonville, Fla.	Sept. 11, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Jacksonville, Fla.	July 1, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Key West, Fla.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Knoxville, Tenn.	Jan. 15, 1875	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
La Crosse, Wis.	Oct. 16, 1872	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Lawson, Kans.	May 21, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Lawson, Kans.	Jan. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Little Rock, Ark.	July 1, 1877	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Los Angeles, Cal.	July 1, 1877	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Louisville, Ky.	Sept. 11, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Lynchburg, Va.	Aug. 20, 1878	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Madison, Wis.	May 24, 1878	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Manassas, Va.	July 1, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Memphis, Tenn.	May 24, 1871	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Metuchen, N. J.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Metuchen, N. J.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2
Montgomery, Ala.	Nov. 1, 1870	Miles. 4,968.0	Miles. 4,230.3	Miles. 4,230.3	Miles. 4,217.6	Miles. 5,872.9	Miles. 4,953.8	Miles. 4,783.8	Miles. 4,517.9	Miles. 4,914.7	Miles. 4,777.4	Miles. 4,610.8	Miles. 4,253.2	Miles. 59,919.2

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## APPENDIX 63.

Table showing the average hourly velocity of the wind, in miles, at stations of the Signal Service, United States Army, for each month and the year.

[Computed from the commencement of observations at each to and including December, 1882. The average hourly velocity is obtained by dividing the mean monthly movement by twenty-four times the number of days in the month.]

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Albany, N. Y.	Dec. 22, 1873	7.9	8.5	9.0	8.5	7.1	5.9	5.1	4.4	5.0	6.9	7.2	7.4	6.8
Alpena, Mich.	Sept. 10, 1873	9.2	10.1	10.4	8.0	8.3	8.1	7.5	7.0	8.4	9.0	9.6	9.5	7.4
Apache, Fort, Ariz.	Oct. 9, 1877	5.0	5.5	7.0	8.2	8.3	7.9	6.1	5.2	5.6	5.7	5.5	5.2	6.3
Assinaboine, Fort, Mont.	Oct. 6, 1879	10.6	12.3	10.2	10.0	10.3	9.7	10.1	9.2	8.8	9.7	11.6	10.9	10.4
Atlanta, Ga.	Sept. 25, 1878	10.3	11.3	11.2	9.0	7.9	7.4	7.3	7.2	7.7	8.7	9.7	9.7	8.9
Atlantic City, N. J.	Dec. 10, 1873	9.8	10.8	12.0	11.7	10.1	8.7	7.7	9.0	10.4	9.6	9.7	9.6	9.9
Augusta, Ga.	Nov. 2, 1870	2.5	4.3	4.9	4.5	4.0	2.9	3.3	3.1	3.4	3.6	3.7	3.3	3.8
Baltimore, Md.	Jan. 1, 1871	6.5	6.1	7.1	6.8	6.0	5.6	5.6	4.9	5.2	6.3	5.5	5.7	5.8
Barnegat City, N. J.	Dec. 10, 1873	13.2	13.9	13.7	13.6	11.8	10.6	9.6	10.7	12.4	12.5	13.6	12.9	12.4
Behring's Island, Behring Sea.	May 22, 1883	13.6	15.1	14.4	13.4	14.0	12.0	10.5	10.4	10.7	15.2	14.4	13.1	13.2
Bennett, Fort, Dak.	Dec. 22, 1879	6.8	6.4	8.0	8.0	9.9	8.2	7.8	8.7	8.5	7.8	7.5	7.0	7.6
Benton, Fort, Mont.	Oct. 11, 1879	7.7	8.8	8.7	8.1	8.0	7.3	6.4	5.7	6.7	6.8	8.6	8.3	8.2
Bismarck, Dak.	Sept. 15, 1874	8.1	8.6	9.7	11.6	10.8	9.4	9.2	8.7	9.1	9.0	17.1	17.3	14.8
Block Island, R. I.	Sept. 1, 1877	4.5	4.9	5.5	6.0	6.0	5.0	4.5	3.8	3.8	3.9	3.7	3.5	4.6
Boisé City, Idaho	July 1, 1877	9.7	10.6	11.3	10.0	8.7	7.7	7.3	7.1	14.2	15.0	10.1	9.9	9.1
Boston, Mass.	Nov. 1, 1870	7.0	8.2	8.2	8.9	7.6	7.3	6.9	5.0	4.3	5.2	6.9	7.0	6.9
Brownsville, Tex.	Aug. 23, 1875	11.0	10.7	10.4	8.7	7.8	7.2	7.2	6.5	8.0	9.0	10.8	11.9	9.1
Buffalo, N. Y.	Nov. 1, 1870	7.2	6.4	8.1	10.2	9.9	8.4	8.7	9.2	8.4	6.7	7.9	7.7	7.3
Buford, Fort, Dak.	Oct. 23, 1878	6.3	8.5	10.0	8.9	7.4	6.5	5.2	4.8	5.7	6.7	7.9	6.7	7.3
Cairo, Ill.	June 1, 1871	7.7	8.6	10.4	13.8	11.8	11.0	9.7	9.7	12.6	13.0	13.7	13.3	12.5
Cape Henry, Va.	Dec. 15, 1873	12.6	13.6	14.7	13.8	11.8	10.8	10.0	9.8	11.7	13.6	15.7	15.0	13.2
Cedar Keys, Fla.	May 24, 1871	14.3	16.1	16.4	14.6	12.5	9.3	8.4	9.1	7.3	7.7	7.8	7.5	9.2
Charleston, S. C.	Nov. 7, 1879	9.0	9.6	11.1	10.4	9.8	8.8	8.2	8.4	8.9	7.7	7.5	8.6	7.9
Charlotte, N. C.	Jan. 5, 1871	7.3	8.1	8.8	8.6	8.8	8.2	7.7	7.3	7.8	7.7	7.5	7.1	7.5
Chattanooga, Tenn.	Oct. 6, 1878	5.2	6.3	6.6	6.3	5.3	4.6	4.6	4.6	4.6	4.8	5.2	5.1	5.3
Chicago, Ill.	Jan. 8, 1879	4.3	7.8	7.8	7.3	5.4	5.2	4.7	4.5	4.6	4.8	5.7	6.3	5.8
Chickasaw, Va.	Nov. 1, 1870	12.8	12.3	12.4	11.9	10.5	9.3	8.9	8.0	8.7	9.9	11.0	11.2	10.0
Cincinnati, Ohio	Nov. 1, 1870	13.0	12.1	12.0	12.7	12.9	11.6	10.1	8.9	11.8	12.0	13.6	12.6	12.4
Cleveland, Ohio	Mar. 14, 1880	13.0	13.0	12.0	12.7	12.9	11.6	10.1	8.9	11.8	12.0	13.6	12.6	12.4
Columbus, Ohio	Nov. 1, 1870	10.7	10.3	10.8	9.2	8.3	7.6	7.3	6.8	8.7	9.8	11.3	10.9	9.3
Cum gratia, Fort, Mont.	July 1, 1878	4.0	6.3	8.9	18.5	17.0	7.0	7.0	6.4	6.0	6.4	7.9	7.9	7.4
Dec. 1, 1878	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3

[illegible]

Table showing the average hourly velocity of the wind in miles, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
North Platte, Nebr.	Sept. 18, 1874	9.9	10.1	12.6	12.6	14.1	12.0	12.1	11.6	11.6	11.5	10.3	9.1	11.6
Olympia, Wash. T.	July 1, 1877	4.5	4.8	4.4	4.4	4.1	3.9	2.6	2.0	2.3	4.0	4.0	4.4	4.0
Omaha, Nebr.	Nov. 1, 1870	9.1	8.4	10.8	10.9	9.5	8.9	7.0	6.8	7.7	8.6	8.7	9.9	8.9
Owago, N. Y.	Nov. 1, 1870	10.6	10.9	10.3	8.8	7.5	6.4	6.2	6.8	7.3	8.6	10.4	10.6	8.6
Palestine, Tex.	Dec. 3, 1881	9.1	16.3	10.3	10.3	9.9	7.6	8.0	9.2	7.6	9.1	9.1	10.6	9.9
Pensacola, Fla.	Oct. 27, 1879	6.9	8.3	8.6	8.9	8.7	8.3	6.7	7.6	7.6	7.9	7.7	7.3	7.8
Philadelphia, Pa.	Jan. 1, 1871	10.4	10.9	12.1	11.1	9.6	8.0	8.4	7.6	8.3	9.3	8.6	10.0	8.7
Pike's Peak, Colo.	Nov. 1, 1873	24.7	24.7	23.3	21.1	21.9	18.0	18.3	12.0	19.8	21.8	22.8	22.9	20.3
Pittsburg, Pa.	Nov. 1, 1870	6.7	6.8	7.6	7.6	9.0	8.5	5.1	4.4	4.9	6.4	6.7	7.9	6.0
Port Huron, Mich.	July 25, 1874	10.1	10.8	10.7	10.7	10.0	8.5	7.8	7.2	9.3	9.4	10.5	10.4	9.6
Portland, Me.	Jan. 15, 1871	7.6	8.4	9.1	8.8	7.8	6.9	6.6	7.2	7.7	7.3	8.3	7.9	7.6
Portland, Ore.	Nov. 1, 1871	0.0	5.1	9.1	7.7	4.8	4.7	4.7	4.1	4.2	4.1	4.5	4.7	4.7
Prescott, Ariz.	Nov. 10, 1873	4.0	5.7	12.4	10.1	8.3	7.4	6.8	7.7	9.3	9.7	5.0	7.2	5.9
Provincetown, Mass.	Feb. 15, 1862	12.1	11.7	12.4	10.1	10.0	8.7	7.8	7.3	9.0	8.0	11.2	11.7	10.2
Rio Grande City, Tex.	July 1, 1877	6.9	7.9	7.3	7.3	7.5	8.9	8.7	7.3	9.3	8.3	6.7	7.9	6.6
Rochester, N. Y.	May 28, 1873	11.1	11.3	11.6	10.4	9.6	10.0	10.7	7.3	9.3	8.8	5.4	10.2	7.9
Roseburg, Ore.	Nov. 1, 1870	3.0	3.1	9.3	2.6	3.6	3.8	2.6	2.3	2.8	2.6	10.8	10.8	3.1
Sacramento, Cal.	July 1, 1877	0.5	6.6	7.0	7.6	9.7	7.6	6.7	7.4	8.5	5.2	4.7	10.2	6.4
Saint Louis, Mo.	Nov. 1, 1870	10.3	10.3	11.6	10.7	9.7	10.5	11.4	12.7	13.5	14.3	10.6	10.3	9.6
Saint Michael's, Fort, Alaska	June 28, 1874	12.9	12.8	12.8	11.7	10.5	8.5	7.3	7.3	8.2	8.8	8.3	11.4	8.4
Saint Paul, Minn.	Nov. 1, 1870	7.8	8.2	9.3	9.6	9.6	8.3	8.1	7.1	8.2	8.7	10.4	9.9	9.3
Saint Vincent, Minn.	Sept. 5, 1880	9.7	10.4	10.3	9.5	9.4	6.1	6.8	7.1	5.5	4.9	4.0	8.0	6.9
Salt Lake City, Utah	Mar. 10, 1874	8.9	4.3	5.8	6.4	5.5	6.1	6.3	6.0	5.9	5.1	5.1	5.1	5.9
San Diego, Cal.	Nov. 1, 1871	5.1	6.0	6.4	6.6	6.7	6.3	6.3	10.3	13.7	13.1	14.5	13.9	13.1
Sandusky, Ohio	Aug. 2, 1877	12.3	14.3	12.0	14.3	12.7	12.1	10.3	10.3	12.8	14.7	14.5	13.7	14.0
Sandy Hook, N. J.	Dec. 10, 1873	14.5	14.6	16.7	14.3	12.3	12.6	12.9	12.1	9.9	7.6	6.1	9.4	9.4
San Francisco, Cal.	Mar. 8, 1871	7.2	7.3	8.9	10.1	11.3	12.6	12.9	12.1	9.9	9.0	6.3	12.1	9.5
Savannah, Ga.	Jan. 1, 1871	6.3	7.1	7.3	7.9	7.4	6.3	5.7	6.5	7.7	9.5	11.1	12.1	8.3
Shaw, Fort, Mont.	Apr. 1, 1880	11.3	13.7	11.8	9.9	9.5	6.4	4.3	2.6	4.0	4.3	2.0	12.1	4.3
Shreveport, La.	Sept. 2, 1871	5.0	5.8	6.3	6.4	12.1	12.3	10.0	8.2	10.0	11.3	11.3	12.1	11.0
Sil, Fort, Ind. T.	June 23, 1875	10.0	11.3	12.3	13.7	12.1	12.3	10.0	8.2	10.0	11.3	11.3	12.1	11.0
Sittka, Alaska	Mar. 20, 1881	2.4	10.6	10.7	12.8	12.3	10.3	10.3	4.7	10.3	11.3	11.3	12.1	11.0
Spokane, Wash. T.	Oct. 10, 1879	4.3	4.1	10.7	12.8	12.3	10.3	10.3	4.7	10.3	11.3	11.3	12.1	11.0
Sturgis, S. Dak.	Feb. 1, 1879	6.7	10.3	10.8	10.1	11.7	11.7	10.4	11.7	12.1	12.1	12.1	12.1	12.1
Uniontown, Pa.	July 24, 1876	6.0	10.3	10.8	10.1	11.7	11.7	10.4	11.7	12.1	12.1	12.1	12.1	12.1
Waco, Tex.	Nov. 1, 1870	9.9	10.3	10.8	10.1	11.7	11.7	10.4	11.7	12.1	12.1	12.1	12.1	12.1
Wichita, Kan.	Nov. 1, 1870	9.9	10.3	10.8	10.1	11.7	11.7	10.4	11.7	12.1	12.1	12.1	12.1	12.1
Yukon, Alaska	Aug. 16, 1873	12.3	10.1	10.3	10.1	11.0	10.7	10.4	11.0	11.0	11.0	11.0	11.0	11.0

	Sept. 10, 1871	Nov. 1, 1870	Oct. 1, 1861	Jan. 1, 1871	Apr. 1, 1873	Nov. 13, 1873
Vicksburg, Miss.....	5.9	5.4	6.7	6.2	4.8	4.3
Washington City.....	6.4	7.1	8.0	6.5	5.9	5.2
West Las Animas, Colo.	8.4	8.0	12.3	12.9	9.4	8.6
Wilmington, N. O.....	7.1	7.7	8.9	7.3	6.0	5.3
Yankton, Dak.....	8.8	9.4	10.9	12.0	9.5	8.1
Yuma, Ariz.....	4.6	7.0	6.2	4.8	4.0	4.9



### REPORT OF THE CHIEF SIGNAL OFFICER.

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Table showing the average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, &amp;c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Norfolk, Va. ....	Jan. 1, 1871	4.0	4.2	0.0	2.5	4.9	4.5	0.0	1.1	4.8	4.8	4.2	4.5	3.0
North Platte, Nebr. ....	Sept. 18, 1874	7.9	7.9	6.8	7.0	6.4	5.9	4.6	4.7	4.2	4.3	4.2	4.0	4.40
Olympia, Wash. T. ....	July 1, 1877	7.9	7.9	6.8	7.0	6.4	5.9	4.6	4.7	4.2	4.3	4.2	4.0	4.50
Omaha, Neb. ....	Nov. 1, 1870	7.9	7.9	6.8	7.0	6.4	5.9	4.6	4.7	4.2	4.3	4.2	4.0	4.60
Oswego, N. Y. ....	Nov. 1, 1870	7.9	7.9	6.8	7.0	6.4	5.9	4.6	4.7	4.2	4.3	4.2	4.0	4.60
Palestine, Tex. ....	Dec. 8, 1881	6.2	6.2	6.0	5.8	4.4	4.2	4.9	4.7	4.6	4.5	4.6	4.3	4.10
Panama, Fla. ....	Oct. 27, 1879	5.7	5.7	4.0	5.0	4.2	4.4	4.8	4.7	4.6	4.5	4.6	4.3	4.70
Philadelphia, Pa. ....	Jan. 1, 1871	5.5	5.5	4.5	5.4	4.5	4.8	4.8	4.7	4.6	4.5	4.6	4.3	4.70
Pike's Peak, Colo. ....	Nov. 1, 1873	7.1	7.1	4.5	5.4	4.5	4.8	4.8	4.7	4.6	4.5	4.6	4.3	4.10
Pittsburg, Pa. ....	Nov. 1, 1873	7.1	7.1	4.5	5.4	4.5	4.8	4.8	4.7	4.6	4.5	4.6	4.3	4.70
Port Huron, Mich. ....	July 25, 1874	7.1	7.1	4.5	5.4	4.5	4.8	4.8	4.7	4.6	4.5	4.6	4.3	4.70
Portland, Me. ....	July 15, 1871	4.0	4.0	6.0	5.4	6.0	5.0	4.8	4.3	4.2	4.0	3.8	3.9	5.00
Portland, Ore. ....	Nov. 1, 1871	7.2	7.2	7.4	7.9	6.7	5.3	3.7	3.8	4.2	4.0	3.7	3.9	5.00
Prescott, Ariz. ....	Nov. 19, 1873	2.8	2.4	2.2	2.6	1.7	1.8	2.7	3.0	4.2	3.0	1.7	2.5	2.80
Provincetown, Mass. ....	Feb. 15, 1882	6.0	4.7	3.2	4.4	5.2	4.0	4.3	3.8	1.9	2.3	2.0	4.3	2.80
Red Bank, Cal. ....	July 1, 1877	4.4	4.7	3.8	4.3	4.1	4.0	1.1	4.6	3.8	4.0	4.5	4.7	4.50
Rio Grande City, Tex. ....	May 24, 1875	7.9	7.9	6.8	7.0	6.4	5.9	4.6	4.7	4.2	4.3	4.2	4.0	4.60
Rochester, N. Y. ....	Nov. 1, 1870	7.2	7.2	6.0	6.6	5.3	4.8	3.4	4.3	4.0	3.8	3.7	3.9	5.10
Rochburg, Ore. ....	July 15, 1877	4.2	4.4	3.6	3.4	2.6	1.1	0.5	2.3	2.0	1.8	2.6	4.0	2.50
Sacramento, Cal. ....	July 1, 1877	7.2	7.2	6.0	6.6	5.3	4.8	3.4	4.3	4.0	3.8	3.7	3.9	5.10
Saint Louis, Mo. ....	June 28, 1874	6.3	4.4	3.6	3.4	2.6	1.1	0.5	2.3	2.0	1.8	2.6	4.0	2.50
Saint Michael's, Fort, Alaska. ....	Nov. 1, 1870	4.9	4.8	3.6	3.4	2.6	1.1	0.5	2.3	2.0	1.8	2.6	4.0	2.50
Saint Paul, Minn. ....	Sept. 1, 1880	4.9	4.8	3.6	3.4	2.6	1.1	0.5	2.3	2.0	1.8	2.6	4.0	2.50
Saint Vincent, Minn. ....	Mar. 19, 1874	4.4	4.7	3.1	3.1	3.1	4.9	7.6	3.4	3.2	3.0	3.3	3.5	4.80
Salt Lake City, Utah. ....	Mar. 19, 1874	4.4	4.7	3.1	3.1	3.1	4.9	7.6	3.4	3.2	3.0	3.3	3.5	4.80
San Diego, Cal. ....	Nov. 1, 1871	4.1	4.4	4.3	4.4	4.6	3.0	4.4	4.5	4.8	5.0	4.7	4.1	4.70
Sandusky, Ohio. ....	Aug. 2, 1877	7.1	6.2	6.2	5.8	4.4	3.0	4.7	4.0	4.2	4.0	4.7	3.7	4.20
Sandy Hook, N. J. ....	Aug. 10, 1873	4.5	4.5	4.4	4.6	4.6	4.8	4.6	4.3	4.5	4.5	4.5	4.5	4.50
San Francisco, Cal. ....	Mar. 8, 1871	4.0	4.7	4.5	4.5	4.4	4.8	4.6	4.4	4.6	4.5	4.5	4.5	4.50
Savannah, Ga. ....	Jan. 1, 1871	5.1	4.9	4.5	4.5	4.4	4.8	4.6	4.4	4.6	4.5	4.5	4.5	4.50
Shaw, Fort, Mont. ....	Apr. 1, 1880	5.0	4.5	4.3	4.5	4.4	4.8	4.6	4.4	4.6	4.5	4.5	4.5	4.50
Shreveport, La. ....	Sept. 1, 1871	5.0	4.5	4.3	4.5	4.4	4.8	4.6	4.4	4.6	4.5	4.5	4.5	4.50
Sill, Fort, Ind. T. ....	June 28, 1875	4.6	4.6	4.3	4.5	4.4	4.8	4.6	4.4	4.6	4.5	4.5	4.5	4.50
Sioux, Alaska. ....	Mar. 20, 1881	7.1	4.6	4.3	4.5	4.4	4.8	4.6	4.4	4.6	4.5	4.5	4.5	4.50
Southfield, N. C. ....	Oct. 15, 1875	7.0	4.9	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.60
Springfield, Ill. ....	Feb. 6, 1881	7.0	4.9	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.60
Stockton, Fort, Tex. ....	Feb. 24, 1878	5.7	4.9	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.60

Thomas, Camp, Ariz.....	Sept. 22, 1877	2.3	3.7	3.1	3.0	1.6	2.0	4.5	4.3	2.1	2.3	2.6	2.80
Toledo, Ohio.....	Nov. 1, 1870	5.0	0.2	0.3	5.0	5.0	4.0	4.0	4.3	4.7	0.0	2.0	5.70
Wichburg, Miss.....	Sept. 10, 1871	5.0	5.6	4.9	4.4	4.2	4.0	4.2	4.1	4.6	4.9	2.0	4.00
Wilmington, N. C.....	Nov. 1, 1871	4.2	5.5	5.5	5.4	4.8	4.9	4.6	4.9	4.9	2.2	2.7	2.30
West Las Animas, Colo.....	Oct. 1, 1871	5.3	3.4	3.4	4.3	5.4	3.6	4.6	3.8	3.7	4.9	4.9	4.00
Wilmington, N. C.....	Jan. 1, 1871	4.0	4.8	4.8	4.7	4.6	4.9	5.0	5.4	4.3	4.3	4.8	4.50
Yankton, Dak.....	April 1, 1872	4.0	4.8	5.1	4.9	5.6	4.7	4.1	3.8	4.3	4.3	4.8	4.50
Yuma, Ariz.....	Nov. 18, 1872	2.3	2.0	1.9	1.4	0.8	0.6	1.6	2.1	0.9	1.8	1.9	1.45



## APPENDIX 65.

Table showing the average number of clear, fair, and cloudy days at stations of the Signal observations at each, to and

Stations.	January.			February.			March.			April.			May.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Albany, N. Y.	6.1	12.5	12.4	8.0	10.6	9.6	6.1	12.9	12.0	8.0	11.3	10.7	8.6	13.1	8.3
Alpena, Mich.	2.5	11.7	16.8	5.9	10.7	11.6	6.4	12.5	12.1	9.3	11.5	9.2	9.7	13.5	7.8
Apache, Fort, Ariz.	15.6	9.8	5.0	13.6	9.4	5.2	18.6	7.6	4.8	18.0	10.4	1.6	6.3	6.5	1.8
Assinaboine, Fort, Mont.	6.0	14.3	10.7	9.3	10.4	8.3	9.7	12.0	9.3	8.0	14.7	7.3	6.5	10.5	8.8
Atlanta, Ga.	5.4	11.8	13.8	7.8	8.6	11.8	11.6	10.4	9.0	9.4	13.0	7.6	11.1	12.2	7.0
Atlantic City, N. J.	7.9	10.7	12.4	8.9	10.0	9.3	9.2	11.8	10.0	9.3	10.6	10.7	9.6	13.2	7.8
Augusta, Ga.	10.6	9.6	10.8	7.8	11.8	8.6	12.2	10.1	8.7	10.6	11.6	7.6	12.2	12.2	7.8
Baltimore, Md.	7.0	13.2	10.8	7.9	12.5	7.6	8.9	11.5	10.6	7.5	12.6	9.9	10.6	13.1	8.4
Barneget City, N. J.	7.0	11.9	12.1	8.2	10.5	9.5	6.4	12.2	10.4	7.6	11.1	11.3	8.8	14.4	4.8
Bennett, Fort, Dak.	7.0	18.0	6.0	9.7	10.7	7.8	7.0	15.3	8.7	6.3	12.4	11.3	5.7	13.2	12.1
Benton, Fort, Mont.	6.0	11.5	13.5	7.2	11.2	9.8	8.4	13.0	10.5	9.0	12.0	9.0	6.0	13.5	11.1
Bismarck, Dak.	10.2	14.2	6.6	8.3	11.0	8.9	6.4	12.9	11.7	7.7	12.4	9.9	5.5	14.6	10.8
Block Island, R. I.	8.7	13.7	8.6	10.4	12.6	5.2	11.7	12.0	7.3	11.7	12.3	6.6	9.5	15.0	4.8
Boise City, Idaho	6.0	9.8	15.2	5.3	9.2	13.7	9.3	12.5	9.2	7.7	13.3	9.0	8.0	15.5	9.4
Boston, Mass.	7.8	10.2	13.0	9.3	8.9	10.0	8.7	9.5	12.8	6.0	12.0	11.1	7.4	14.2	9.4
Brownsville, Tex.	8.1	8.1	14.8	7.2	8.0	13.0	7.6	10.4	13.0	6.4	13.7	9.9	9.3	15.5	9.4
Buffalo, N. Y.	1.4	9.2	20.4	4.7	10.7	12.8	5.1	12.0	13.9	6.3	11.9	11.8	8.8	17.1	8.7
Buford, Fort, Dak.	9.1	14.8	7.1	10.7	11.1	6.4	8.6	13.6	8.8	10.6	11.8	7.6	9.5	14.3	7.7
Cairo, Ill.	6.6	11.7	12.7	7.7	10.3	10.2	8.8	11.7	10.5	8.8	11.7	7.5	8.8	14.3	7.7
Cape Henry, Va.	7.2	11.1	12.7	8.5	11.1	8.6	8.4	12.5	10.1	9.9	9.9	10.2	12.2	10.2	11.1
Cape May, N. J.	11.0	9.0	11.0	10.7	7.5	10.0	10.1	9.1	11.8	10.2	8.3	10.5	12.6	9.6	7.7
Cape Mendocino, Cal.	12.7	13.7	4.6	18.0	7.0	3.0	20.4	1.3	9.3	11.0	10.5	4.0	11.0	15.0	5.0
Cedar Keys, Fla.	8.5	14.7	7.8	13.8	9.2	5.2	14.0	12.2	4.8	15.8	10.5	3.7	13.3	13.5	5.7
Charleston, S. C.	9.5	10.5	11.0	11.2	9.1	7.9	12.7	10.8	7.5	12.0	11.3	6.7	11.8	13.2	5.7
Charlotte, N. C.	5.6	10.8	14.6	9.0	8.0	11.2	8.4	13.8	8.8	8.6	12.0	9.4	8.6	16.0	4.8
Chattanooga, Tenn.	6.7	9.6	14.7	7.2	10.2	10.8	11.0	9.0	11.0	10.2	12.4	7.6	12.6	11.0	4.8
Cheyenne, Wyo.	13.2	13.8	4.0	12.5	12.0	3.7	11.4	13.9	5.7	8.9	13.9	7.2	7.4	14.6	4.8
Chicago, Ill.	7.8	12.9	10.3	8.3	11.3	8.6	7.1	13.0	10.9	8.1	12.2	9.7	11.1	11.4	8.8
Chincoteague, Va.	4.7	13.0	13.3	7.3	13.3	6.4	9.5	13.1	8.4	8.0	13.8	8.2	10.5	12.2	8.8
Cincinnati, Ohio	4.8	10.2	16.0	5.9	9.8	12.5	6.1	11.9	13.0	8.2	11.8	10.0	8.8	13.3	8.8
Cleveland, Ohio.	2.8	8.4	19.8	4.7	11.7	11.8	4.3	12.2	14.5	7.3	12.9	9.8	10.6	13.2	7.8
Columbus, Ohio.	3.2	11.4	16.4	4.2	10.2	13.8	5.0	12.0	14.0	10.8	8.6	10.6	11.4	13.2	8.8
Concho, Fort, Tex.	14.2	8.2	8.6	13.2	7.2	6.8	15.0	8.0	8.0	15.4	10.0	4.0	10.3	13.2	8.8
Custer, Fort, Mont.	9.3	15.4	6.3	4.3	17.7	6.2	7.0	18.7	5.3	5.0	18.0	7.0	5.7	18.7	7.0
Davenport, Iowa.	8.3	11.2	11.5	8.0	10.8	9.4	7.7	12.9	10.4	8.4	12.2	9.4	8.1	12.7	9.4
Davis, Fort, Tex.	18.4	9.2	3.4	15.6	8.9	3.7	17.4	9.2	4.4	20.3	7.3	2.4	15.0	10.2	2.8
Dayton, Wash. T.	1.8	10.0	19.2	6.2	10.5	11.5	10.5	13.3	7.2	7.5	11.0	8.8	13.4	10.4	8.0
Deadwood, Dak.	11.0	13.5	6.5	8.5	14.0	5.7	9.3	14.0	7.7	8.0	11.7	10.3	8.8	13.2	7.8
Delaware Breakwater, Del.	3.0	13.0	15.0	8.8	10.2	9.2	7.0	13.8	10.2	9.5	11.8	7.8	8.9	14.4	7.2
Denver, Colo.	15.8	11.4	3.8	13.0	11.7	7.5	13.3	11.1	6.6	10.0	13.2	7.8	8.9	14.4	7.2
Des Moines, Iowa.	11.0	11.0	9.0	10.0	10.4	7.8	8.4	14.4	8.0	9.0	11.2	8.6	9.2	13.5	8.0
Detroit, Mich.	3.8	9.6	17.6	5.8	11.4	11.0	5.5	12.0	13.5	6.9	12.8	10.0	6.0	17.4	8.7
Dodge City, Kans.	11.6	10.0	9.4	12.6	9.2	6.4	11.7	11.9	7.4	12.1	11.1	7.2	12.2	11.1	7.1
Dubuque, Iowa.	6.2	12.5	12.3	7.7	10.2	10.3	5.8	13.2	12.0	7.1	13.2	10.7	7.2	12.2	11.1
Duluth, Minn.	10.4	11.3	9.3	8.5	9.8	9.9	10.9	10.8	9.3	9.5	11.1	9.4	8.3	13.2	10.4
Eastport, Me.	7.1	12.3	11.6	7.0	11.1	11.0	6.3	10.5	14.2	6.9	8.4	14.7	6.3	13.2	10.4
Elliot, Fort, Tex.	17.0	6.8	7.2	16.3	5.5	6.4	13.9	12.5	4.6	18.5	5.2	1.9	14.0	6.0	1.7
El Paso, Tex.	17.4	10.4	3.2	17.9	6.3	4.0	20.8	7.6	2.6	22.2	5.6	1.9	14.0	6.0	1.7
Erie, Pa.	2.2	10.1	18.7	4.6	11.1	12.5	4.9	11.3	14.8	6.5	13.6	6.5	6.8	13.2	10.4
Escanaba, Mich.	4.6	13.2	13.2	5.8	11.6	10.8	7.6	12.3	11.1	8.4	12.6	7.0	10.4	10.6	7.8
Fort Smith, Ark.	9.5	8.6	12.9	6.0	7.0	15.0	9.0	12.0	10.4	10.4	9.0	8.9	5.5	15.0	7.8
Galveston, Tex.	8.3	9.2	13.5	7.4	10.2	10.6	8.3	12.5	10.2	9.8	13.0	8.3	11.6	11.7	8.8
Grand Haven, Mich.	1.9	8.6	20.5	5.0	10.8	12.4	4.9	13.0	13.1	9.1	12.2	10.0	1.0	22.0	5.8
Grant, Fort, Ariz.	15.8	9.6	5.6	13.2	8.8	6.2	16.8	9.0	5.2	20.5	6.5	8.7	9.0	10.2	7.8
Hatteras, N. C.	5.3	15.3	10.4	8.0	10.2	8.0	9.0	11.0	11.0	6.4	13.3	7.7	5.5	17.7	7.8
Helena, Mont.	2.3	15.3	13.4	6.0	14.7	7.3	10.7	14.0	6.3	8.8	13.0	5.8	7.5	15.2	5.1
Huron, Dak.	8.0	18.5	4.5	10.5	11.5	6.0	4.0	16.0	11.0	7.5	12.0	10.0	9.8	13.2	8.8
Indianapolis, Ind.	5.3	10.5	15.2	6.5	9.4	12.2	6.5	10.6	13.8	7.2	13.0	6.3	8.8	13.2	8.8
Indianola, Tex.	7.9	12.5	10.6	6.1	11.0	11.1	6.9	14.3	9.9	8.7	12.3	8.8	8.8	13.2	8.8
Jacksonville, Fla.	9.0	12.8	9.2	9.7	10.4	8.1	12.7	13.0	5.3	12.0	11.1	8.8	6.2	14.4	10.4
Keokuk, Iowa.	5.4	11.7	13.9	5.9	11.1	11.2	4.0	14.4	12.6	5.0	14.2	10.8	2.8	13.6	10.4
Key West, Fla.	11.3	14.7	3.5	11.7	12.6	3.9	15.8	12.5	5.2	17.3	13.3	2.2	9.3	13.3	2.2
Kitty Hawk, N. C.	9.7	12.0	9.3	9.7	9.8	8.7	10.2	11.6	9.2	9.4	13.6	7.2	12.2	12.2	7.2
Knoxville, Tenn.	6.1	10.2	14.7	7.3	9.5	11.4	9.1	11.4	10.5	8.7	10.6	9.6	11.4	13.4	8.8
La Crosse, Wis.	9.0	12.5	9.5	8.7	11.8	7.7	8.3	12.8	9.9	8.7	11.6	8.7	9.4	13.2	8.4

## APPENDIX 65.

Service, United States Army, for each month of the year. (Compiled from the commencement of including December, 1883.)

June.			July.			August.			September.			October.			November.			December.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
8.1	12.3	8.6	10.9	12.8	7.2	12.3	12.9	6.4	8.2	11.7	9.1	8.1	12.6	10.3	4.5	11.4	14.1	4.1	11.1	15.8
9.7	13.7	6.6	11.1	14.2	5.7	11.3	14.1	5.6	8.3	11.9	9.8	8.4	10.8	13.8	1.8	11.4	16.8	1.6	8.6	20.0
12.0	4.8	2.2	9.3	13.0	8.7	10.7	14.0	6.3	17.9	8.1	4.0	22.4	6.8	1.8	21.8	6.2	2.5	17.5	9.2	4.3
12.5	11.0	6.5	13.6	10.1	1.8	15.3	13.5	2.2	12.8	13.0	4.2	8.5	13.0	9.5	6.2	15.0	8.8	9.0	14.2	7.8
7.4	15.4	7.2	9.2	15.4	6.4	6.8	14.6	9.6	11.6	11.2	7.2	11.2	10.1	9.7	10.2	1.3	9.5	8.5	11.7	10.8
9.9	13.5	6.6	10.9	13.4	6.7	11.1	10.3	9.6	10.6	10.5	8.9	12.8	10.0	8.2	9.7	10.8	10.0	9.4	11.5	10.1
8.4	15.3	6.3	10.4	14.4	6.2	8.1	15.2	7.7	10.3	12.5	7.2	14.2	10.1	6.7	10.4	10.1	9.5	10.9	10.6	9.5
7.5	15.6	7.2	9.2	14.5	7.3	10.1	11.9	9.0	10.5	11.2	8.8	11.1	12.2	7.7	9.8	11.1	9.1	8.0	13.7	9.3
7.0	18.0	6.2	9.1	15.8	6.6	9.7	14.3	7.0	9.6	12.7	7.7	10.8	12.1	8.1	9.6	10.4	10.0	8.7	12.7	10.3
10.3	12.0	7.7	9.0	13.7	8.3	10.3	15.7	5.0	10.7	15.0	4.8	9.1	14.1	7.8	9.0	14.2	6.8	8.5	15.0	7.5
9.2	14.4	6.4	15.3	13.0	2.7	16.7	11.3	3.0	10.5	13.5	6.0	6.0	13.8	11.2	5.8	14.2	16.0	4.7	16.5	9.8
6.4	15.9	5.7	10.9	15.1	5.0	12.0	13.9	4.1	11.7	12.5	5.8	9.5	12.0	9.5	6.9	13.5	9.6	8.2	14.3	8.6
10.3	13.1	5.4	14.7	12.3	4.0	11.3	15.3	4.4	9.8	13.0	7.2	11.2	12.0	7.8	10.0	12.0	8.0	8.5	14.0	8.5
11.5	13.4	4.2	17.3	12.3	1.4	21.3	8.3	1.4	17.2	8.7	4.1	12.3	10.1	8.6	10.3	10.6	9.1	7.0	9.4	14.6
7.7	11.9	10.4	7.3	13.9	9.8	11.4	11.0	8.6	10.8	9.9	9.3	9.7	11.4	9.9	8.7	10.4	10.9	7.3	11.3	12.4
13.7	12.7	3.6	13.3	14.2	3.5	9.9	10.1	5.0	11.8	12.6	5.6	12.9	13.6	4.5	8.5	12.0	9.5	7.6	11.9	11.5
7.3	14.2	8.5	9.2	15.5	3.3	10.4	14.0	6.6	8.4	12.4	9.2	7.6	10.7	12.8	2.2	5.5	18.3	0.6	8.2	22.2
8.0	14.8	8.6	13.0	15.4	3.4	16.2	11.2	3.6	15.0	11.6	3.4	8.6	12.8	9.6	6.0	16.4	7.6	9.4	14.5	7.1
9.4	14.8	5.8	11.9	12.6	6.5	14.8	17.3	3.9	13.7	11.3	5.0	13.1	10.9	7.0	8.6	10.5	10.9	7.8	10.5	12.7
10.3	13.5	6.2	8.6	15.3	7.1	8.8	14.3	7.9	10.7	10.4	8.9	12.8	10.2	8.0	10.0	9.3	10.7	8.0	11.9	11.1
12.5	9.6	7.9	12.7	11.0	7.3	12.9	8.6	9.5	13.0	8.4	8.6	14.8	7.9	8.3	10.0	8.3	11.7	9.5	9.4	12.1
21.0	6.0	0.0	20.0	5.0	0.0	25.5	5.0	0.5	22.5	5.5	2.0	14.0	12.5	4.5	11.5	14.5	4.0	12.0	15.0	4.0
8.2	18.0	3.8	11.5	14.2	5.3	11.7	14.5	5.0	15.5	12.5	2.0	18.3	8.5	4.2	13.8	10.2	6.0	14.0	11.4	5.6
5.9	14.3	6.2	10.4	14.6	6.0	9.2	14.5	7.3	10.5	10.5	9.0	14.0	10.0	7.0	11.5	10.5	8.0	11.7	16.7	8.6
8.0	15.3	6.7	7.4	10.8	6.8	8.6	13.0	9.4	10.6	10.8	8.6	10.4	10.2	10.4	11.8	7.9	10.3	9.3	11.5	10.2
11.8	15.4	2.8	11.7	15.6	3.8	8.0	16.6	6.4	12.8	12.6	4.6	10.0	12.0	8.4	10.4	9.4	10.2	10.6	10.6	11.8
11.3	15.4	5.3	12.5	13.2	5.3	12.3	14.5	4.3	16.5	9.7	3.8	15.1	10.6	5.3	13.4	12.3	4.3	13.4	13.4	4.2
7.4	14.5	8.1	12.9	12.5	5.6	12.5	13.6	4.9	10.9	12.7	6.4	9.1	12.0	9.3	6.6	10.1	13.3	6.7	11.8	12.5
7.5	18.0	4.5	9.0	16.2	5.8	10.7	12.5	7.8	11.2	12.3	6.5	10.0	12.2	8.8	10.5	11.0	8.5	9.1	13.3	8.6
6.3	12.9	10.8	9.2	13.2	8.6	10.5	12.4	7.7	11.2	10.8	8.0	10.7	11.3	9.0	7.2	11.4	11.4	6.0	10.9	14.1
8.7	13.6	7.7	9.6	15.7	5.7	12.2	13.4	5.4	9.4	11.4	9.2	8.7	10.3	12.0	8.3	9.5	17.2	2.0	9.5	19.5
8.2	13.2	8.6	9.8	16.4	4.8	15.2	11.0	7.5	10.5	12.5	7.0	9.0	12.7	9.3	6.0	12.5	11.5	8.0	10.5	17.5
15.7	10.4	2.9	13.7	12.7	4.6	16.4	10.3	3.7	8.3	11.0	6.3	14.4	10.0	6.6	13.6	9.0	9.8	14.7	8.0	8.3
8.7	10.6	5.3	11.7	16.3	3.0	15.8	13.0	2.2	15.5	11.2	8.0	8.8	13.8	8.4	6.4	16.2	7.4	7.6	12.0	11.4
7.1	14.8	8.1	10.7	15.1	5.2	12.2	12.9	5.9	10.9	12.8	6.3	8.8	12.0	10.2	7.1	11.3	11.6	6.1	12.2	12.7
16.8	11.3	1.9	15.5	11.7	3.8	16.5	9.8	4.7	18.4	6.8	4.8	18.5	9.8	3.2	13.8	7.2	9.0	17.4	9.4	3.2
11.0	13.2	5.8	18.5	10.5	2.0	21.0	9.0	1.0	14.5	12.3	3.2	8.2	13.0	9.8	9.5	10.5	10.0	5.4	9.4	16.2
7.4	10.7	5.6	16.0	12.0	3.0	15.5	12.2	3.3	19.6	8.2	2.2	14.8	10.7	5.5	14.0	9.7	6.3	11.0	13.2	6.8
7.2	14.8	8.0	10.0	14.2	6.8	10.0	14.2	6.8	10.2	12.0	7.8	11.8	10.0	9.2	9.5	10.2	10.3	6.5	15.5	9.0
13.7	12.7	2.6	12.6	14.2	4.2	12.2	14.0	5.0	17.0	8.8	4.2	16.2	9.8	5.0	14.7	10.7	4.0	14.7	13.5	2.8
8.4	13.3	10.6	10.6	14.2	6.2	11.0	13.1	6.9	11.3	12.2	6.5	10.5	11.8	8.7	10.7	11.3	8.0	6.7	13.5	10.8
8.4	13.3	8.3	9.8	14.9	6.3	11.4	12.8	6.8	9.2	12.9	7.9	8.5	12.1	10.4	5.0	10.9	14.1	2.4	11.6	17.0
11.0	14.0	4.4	10.7	14.2	5.6	14.8	12.0	4.2	14.3	11.8	8.9	16.0	8.7	6.3	12.9	11.4	5.7	11.9	12.1	7.0
5.2	12.9	11.9	9.4	13.8	6.8	9.4	14.5	7.1	8.4	13.4	8.2	6.7	12.6	11.7	5.0	11.7	13.2	5.5	12.0	13.5
9.5	13.2	10.2	9.6	15.4	0.0	9.9	12.9	8.2	8.0	11.7	10.3	7.0	9.5	14.5	5.1	11.1	13.8	7.8	10.9	12.3
5.2	11.5	12.3	5.2	14.0	11.8	8.0	11.5	11.5	8.1	10.5	11.4	7.6	11.1	12.3	5.4	10.8	13.8	8.8	11.6	13.6
16.2	9.0	4.3	10.2	14.1	8.0	16.0	10.4	4.6	17.5	6.2	6.3	16.2	7.3	7.5	16.8	7.3	5.9	18.0	6.8	6.2
20.8	8.0	0.0	21.0	21.7	4.3	18.4	10.8	1.8	21.3	6.2	2.5	22.6	7.8	0.0	20.0	6.8	8.2	21.3	7.8	1.9
7.1	13.8	7.5	10.0	14.0	5.5	11.3	14.2	5.5	8.7	12.2	9.1	7.4	9.2	14.4	1.8	8.9	19.3	1.5	6.7	22.8
7.6	14.7	7.5	10.1	14.7	6.2	10.4	13.3	7.3	7.8	13.7	8.5	5.3	11.0	14.7	3.6	11.2	15.2	3.6	11.7	15.7
13.0	13.5	8.5	11.0	11.1	6.0	16.0	10.5	4.5	16.5	8.5	5.0	9.0	13.0	9.0	10.0	12.5	7.5	11.0	10.5	0.5
11.8	13.4	4.8	10.8	16.5	3.7	12.0	14.0	5.0	12.5	11.8	5.7	14.5	10.5	6.0	10.4	10.5	9.1	8.7	10.5	11.8
9.3	13.7	8.8	14.4	12.6	4.0	14.0	12.8	4.2	16.6	12.0	6.5	8.1	10.5	12.4	3.0	9.5	17.5	1.5	7.6	21.9
19.9	8.7	1.8	7.8	16.5	7.2	9.2	15.0	6.9	19.5	5.0	2.5	23.2	6.5	2.3	19.5	7.8	2.7	17.7	8.0	5.3
6.8	20.3	8.4	8.8	14.3	8.4	8.7	11.3	11.0	9.0	11.0	10.0	8.0	15.0	8.0	8.3	13.7	8.0	7.0	16.3	7.7
8.5	13.5	3.1	14.8	14.2	2.0	18.5	10.5	2.0	10.8	10.8	2.4	8.8	15.7	6.5	8.8	14.7	6.5	8.0	14.0	9.0
10.0	16.5	3.5	11.0	14.7	5.8	13.7	13.0	4.3	11.3	13.2	5.4	5.7	14.7	10.6	11.8	12.0	6.7	10.3	14.0	6.7
6.6	13.2	9.6	9.9	14.2	7.5	11.0	14.1	5.9	12.0	11.3	6.7	9.6	12.7	8.7	9.1	10.2	13.7	5.2	10.1	15.7
9.4	16.9	7.3	12.3	16.6	2.2	12.2	15.7	3.1	11.2	12.7	5.1	14.5	11.7	8.6	6.7	11.6	8.7	6.6	10.5	11.9
8.4	14.7	6.3	10.2	16.0	4.8	9.7	16.8	5.0	8.9	12.2	8.6	11.5	11.8	8.2	9.8	11.1	9.1	10.2	12.2	8.8
2.3	15.3	11.4	6.4	16.6	8.0	8.5	16.0	6.5	9.2	13.1	7.7	8.0	13.0	10.0	5.1	11.8	13.1	5.2	11.3	14.5
6.2	18.6	5.2	5.7	19.6	5.5	5.1	20.1	5.8	4.2	19.3	6.5	8.0	15.8	7.2	11.2	13.4	5.4	11.0	15.5	4.5
11.2	13.2	5.6	9.0	16.0	6.0	8.2	15.6	7.2	11.1	10.9	8.0	11.9	10.9	8.2	10.7	11.1	8.2	8.8	14.0	8.1
8.5	14.7	8.8	10.3	14.5	6.2	9.9	14.8	6.8	14.1	9.5	6.4	14.8	9.0	7.2	8.5	10.7	10.8	8.5	10.4	12.1
4.4	18.8	7.8																		

Table showing the average number of clear,

Stations.	January.			February.			March.			April.			May.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Leavenworth, Kans.	9.6	11.0	10.4	9.0	11.0	8.2	8.8	13.2	9.0	9.0	10.1	10.9	8.8	13.5	9.7
Lewiston, Idaho	2.2	7.8	20.0	5.8	9.2	13.2	9.8	12.0	8.2	9.2	10.5	10.3	9.5	13.5	8.8
Little Rock	6.8	10.0	13.6	8.0	9.5	13.7	11.0	9.2	10.8	12.3	10.5	7.2	10.5	12.5	8.1
Los Angeles, Cal.	17.5	8.5	8.0	13.0	9.5	5.7	12.5	10.8	7.7	10.2	12.5	7.7	13.5	11.8	5.7
Louisville, Ky.	3.3	9.2	15.5	6.7	10.5	11.0	7.5	11.1	9.2	8.2	8.1	10.0	6.1	11.1	6.8
Lynchburg, Va.	8.1	11.8	10.4	9.3	11.3	7.6	11.8	10.7	8.4	10.2	11.2	8.6	12.7	11.1	6.4
Macineau City, Mich.	3.0	16.0	12.0	9.0	9.0	10.0	11.0	11.0	9.0	7.0	10.4	9.0	5.0	13.0	12.0
Macon, Fort, N. O.	4.0	13.7	13.2	8.0	11.1	9.1	9.7	12.0	9.2	8.0	9.2	12.7	8.0	13.6	6.3
Maginnis, Fort, Mont.	2.0	14.0	15.0	8.0	15.0	5.0	9.0	7.0	15.0	7.0	10.2	11.0	5.0	11.0	6.5
Marquette, Mich.	3.7	12.8	14.7	5.1	11.0	12.3	7.6	12.2	11.2	8.6	13.2	8.2	9.3	12.7	9.7
Memphis, Tenn.	7.7	9.0	14.3	8.2	8.2	11.6	9.8	10.2	11.0	10.4	10.4	9.2	10.2	12.1	7.7
Milwaukee, Wis.	5.0	15.2	10.8	6.0	12.6	9.6	6.5	13.5	11.0	6.7	13.7	9.6	9.1	13.1	8.5
Mobile, Ala.	8.2	11.8	11.0	8.7	10.9	8.6	11.4	10.5	9.1	11.0	10.6	9.2	12.3	12.5	6.2
Montgomery, Ala.	6.0	11.0	14.0	7.2	10.2	10.8	11.2	12.0	9.6	10.4	10.5	9.1	11.3	13.1	1.6
Moorhead, Minn.	10.0	15.0	6.0	7.3	12.4	8.3	5.7	15.7	9.5	9.0	10.4	7.0	9.3	11.2	20.0
Mount Washington, N. H.	4.3	10.6	16.1	5.8	8.4	14.0	5.7	9.1	16.0	6.0	9.0	15.0	7.2	11.7	12.2
Nashville, Tenn.	5.7	10.7	14.6	6.4	9.5	12.4	8.0	11.0	11.4	7.9	12.4	9.7	9.5	13.8	7.7
New Haven, Conn.	8.1	11.9	11.0	8.5	10.4	9.3	7.5	12.5	11.0	6.6	12.1	11.3	9.0	12.0	9.3
New London, Conn.	8.9	13.1	9.0	10.3	10.5	6.9	8.8	12.7	9.5	7.9	13.4	8.7	10.4	13.1	1.1
New Orleans, La.	7.0	12.2	11.2	8.3	10.5	9.4	10.7	11.0	10.3	10.6	10.3	9.1	10.5	14.2	6.2
New York City.	7.6	11.0	11.8	8.0	10.5	9.7	7.5	13.5	10.0	7.6	12.4	10.0	9.7	12.0	8.2
Norfolk, Va.	8.8	11.2	11.0	8.6	10.9	8.7	10.0	10.8	10.2	9.5	10.5	10.1	10.2	13.3	7.7
North Platte, Nebr.	11.8	14.1	5.6	10.3	12.9	8.0	8.9	14.1	8.0	9.0	14.9	6.1	5.9	14.0	1.1
Olympia, Wash. T.	2.1	9.2	19.7	2.7	6.8	18.7	3.7	10.5	16.8	3.2	12.8	12.0	5.0	11.2	10.4
Omaha, Nebr.	9.3	12.1	9.6	9.3	10.5	8.4	8.2	12.2	9.6	8.6	10.5	10.9	7.1	10.8	11.2
Oswego, N. Y.	1.2	7.2	22.6	3.5	8.8	15.9	4.2	10.7	16.6	6.7	10.4	12.9	9.2	12.1	9.6
Palestine, Tex.	10.0	11.0	10.0	5.0	7.0	16.0	9.3	10.7	11.0	7.5	16.5	6.0	9.0	15.5	6.7
Pensacola, Fla.	5.8	14.5	10.7	9.0	10.8	8.4	13.5	10.0	7.5	9.5	12.2	8.3	11.8	13.5	6.7
Philadelphia, Pa.	6.5	11.5	12.0	7.7	10.2	10.3	7.5	11.0	12.0	7.8	11.2	11.1	10.1	13.0	9.2
Pike's Peak, Colo.	10.8	11.6	5.6	9.9	13.0	5.3	11.0	12.6	7.4	7.8	14.6	7.6	7.1	11.6	7.7
Pittsburg, Pa.	4.0	11.4	15.6	5.0	11.6	11.6	4.6	13.3	12.6	7.0	13.3	9.7	10.3	13.1	7.4
Port Huron, Mich.	8.3	12.3	15.4	6.1	11.1	12.0	4.3	13.8	12.9	7.0	12.2	10.8	7.5	12.9	8.6
Portland, Me.	9.7	12.0	9.3	9.8	11.2	7.2	7.2	11.0	12.2	7.7	11.4	10.9	8.3	11.6	9.9
Portland, Oreg.	3.4	7.0	26.6	2.3	6.3	19.6	4.4	7.0	19.6	5.2	9.2	13.0	5.1	9.9	16.0
Prescott, Ariz.	18.4	10.2	2.4	16.9	7.9	3.4	17.4	8.5	3.8	20.3	7.3	2.4	25.3	9.7	1.1
Provincetown, Mass.	3.0	15.0	13.0	5.5	13.5	9.0	7.0	16.5	7.5	10.0	12.0	8.0	6.0	16.0	8.0
Red Bluff, Cal.	13.7	8.3	9.0	10.8	8.7	8.7	14.0	10.9	8.8	13.2	8.7	7.1	13.0	9.8	5.7
Rio Grande City, Tex.	7.5	11.2	12.3	9.5	9.2	9.5	10.8	11.6	8.0	10.2	11.8	6.0	8.0	16.8	6.2
Rochester, N. Y.	1.5	8.2	21.3	3.1	10.8	14.1	3.9	11.0	16.1	7.3	10.5	12.2	9.2	2.9	8.2
Roseburg, Oreg.	2.2	10.0	18.8	3.7	7.8	17.0	7.3	9.7	14.0	4.3	11.2	14.5	8.4	10.5	13.2
Sacramento, Cal.	12.5	9.8	8.7	12.0	8.8	7.4	13.8	7.7	7.5	14.7	10.3	5.6	20.2	7.3	1.1
Saint Louis, Mo.	8.8	11.3	10.9	8.5	10.5	9.2	7.7	11.0	11.4	9.4	11.8	8.8	9.0	11.5	8.7
Saint Michael's, Fort, Alaska	5.6	9.1	15.3	12.7	6.9	8.6	8.7	10.2	12.1	5.8	8.2	16.0	3.8	9.1	11.1
Saint Paul, Minn.	8.0	13.0	10.0	8.0	10.4	9.0	8.3	12.0	10.7	8.2	12.0	9.8	8.8	14.2	4.4
Saint Vincent, Minn.	9.3	16.8	5.4	8.0	12.0	8.0	7.7	16.0	9.7	7.3	11.8	14.8	4.4	8.1	15.3
Salt Lake City, Utah	7.8	11.0	11.6	7.7	10.8	10.3	10.4	10.0	10.0	7.7	12.7	6.1	9.0	12.5	7.7
San Diego, Cal.	11.3	11.2	8.5	9.0	11.3	7.9	8.7	12.7	9.8	10.2	11.9	7.9	8.0	12.1	10.9
Sandusky, Ohio	4.9	10.3	15.8	5.4	10.4	12.4	5.3	13.2	12.5	7.4	12.4	10.2	11.4	13.0	6.7
Sandy Hook, N. J.	7.7	11.8	11.5	9.1	11.0	8.1	7.4	14.7	8.9	7.3	12.1	10.6	10.0	13.8	7.2
San Francisco, Cal.	12.0	9.6	9.4	8.6	10.8	8.3	11.8	11.4	7.8	12.4	11.3	8.3	10.0	10.2	5.8
Savannah, Ga.	9.0	10.8	11.2	9.1	10.0	9.1	11.4	11.4	8.0	11.1	10.7	8.1	10.6	13.0	9.2
Shaw, Fort, Mont.	6.3	16.0	8.7	7.7	12.7	5.6	10.7	12.3	8.0	10.0	12.0	8.0	7.0	17.5	5.5
Shreveport, La.	7.8	10.2	13.0	8.2	9.5	10.5	8.5	12.6	9.9	9.7	12.4	7.9	8.1	14.7	7.2
Sill, Fort, Ind. T.	10.3	12.7	8.0	9.3	10.0	8.9	11.7	12.2	7.2	6.1	13.1	8.1	9.0	14.7	13.0
Sitka, Alaska	4.0	11.0	16.0	5.3	9.7	13.2	7.3	9.0	14.7	5.8	9.3	14.7	7.3	10.2	21.3
Smithville, N. C.	7.2	12.0	11.8	9.0	9.5	9.7	11.2	10.2	9.2	6.9	11.3	8.0	2.1	10.2	13.3
Spokane Falls, Wash. T.	3.0	13.5	14.5	7.7	7.3	13.0	10.0	12.3	8.7	8.3	12.4	9.8	8.3	13.5	7.0
Springfield, Ill.	7.2	11.5	12.3	9.0	10.2	9.0	8.5	11.5	11.0	9.2	12.7	7.5	10.2	12.0	6.0
Stockton, Fort, Tex.	20.7	5.5	4.8	17.0	7.7	3.5	25.1	5.6	2.0	10.2	7.5	3.1	15.1	5.1	1.8
Thomas, Camp, Ariz.	16.7	10.3	4.0	12.4	13.0	2.8	13.7	10.0	2.7	13.0	7.0	0.9	23.5	3.5	1.8
Tol-do, Ohio	3.6	11.0	16.4	4.7	11.8	11.7	5.8	9.1	15.3	6.5	13.0	8.0	6.0	12.2	7.2
Unalakleet, Alaska	1.8	5.0	24.2	1.0	2.2	24.0	3.0	0.2	22.0	0.9	2.1	23.0	0.9	7.1	23.0
Vicksburg, Miss.	6.0	9.9	14.2	7.4	9.0	10.0	10.0	10.0	10.0	2.0	11.0	8.1	7.4	12.0	11.7
Washington City	6.0	11.8	13.2	6.8	11.8	9.6	7.3	12.7	11.0	6.1	11.2	9.0	10.0	11.1	8.4
West Las Animas, Colo.	12.0	11.0	8.0	10.8	5.5	3.0	10.5	10.4	2.0	10.1	5.3	5.5	4.0	5.0	5.5
Wilmington, N. C.	9.0	10.4	11.6	8.7	7.9	11.6	11.1	6.0	4.0	10.1	11.0	7.0	2.0	10.0	9.0
Yankton, Dak.	10.9	14.1	6.0	9.8	10.0	7.8	9.1	12.8	8.0	9.1	10.1	11.7	8.2	8.0	12.2
Yuma, Ariz.	20.8	8.1	2.1	15.2	6.6	2.4	23.1	6.0	1.3	24.0	5.2	0.2	23.0	2.6	6.4

fair, and cloudy days, &amp;c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
8.0	14.8	8.2	21.4	14.0	5.6	18.8	12.4	4.8	12.4	11.6	6.0	11.7	12.5	6.8	10.8	12.1	7.6	9.1	11.8	10.1
11.8	11.5	2.7	16.8	11.7	2.5	21.8	7.6	2.1	17.5	7.7	4.8	8.0	10.5	12.5	7.5	8.5	13.0	7.2	8.0	15.8
13.5	13.7	2.8	11.6	13.4	6.0	16.2	10.8	4.0	15.4	9.0	5.6	12.7	11.9	6.4	12.0	7.8	10.2	11.5	2.2	11.8
8.5	17.2	4.3	10.4	19.7	0.9	16.0	13.7	1.3	17.1	11.6	1.3	16.4	11.6	8.0	18.8	8.3	1.9	17.4	8.6	5.6
6.8	12.7	9.5	10.4	14.3	6.7	11.5	13.7	5.8	11.5	12.0	6.5	12.0	11.9	7.1	7.3	12.2	12.5	5.8	9.2	15.0
8.8	12.0	8.2	10.2	14.2	6.6	10.2	21.8	9.0	12.3	10.9	6.8	14.8	9.4	6.8	11.2	11.8	7.0	10.6	11.6	8.8
4.0	15.0	11.0	5.0	18.0	8.0	14.0	10.0	5.0	9.5	14.0	6.5	8.0	15.5	12.5	1.5	8.5	19.0	0.5	6.0	24.5
4.7	17.8	8.0	9.0	12.3	9.7	7.3	14.0	8.7	9.7	11.7	8.6	7.3	16.7	7.0	9.7	12.0	8.3	7.3	16.7	7.0
11.0	11.0	8.0	10.5	12.7	2.7	15.5	12.5	3.0	19.0	6.0	5.0	8.0	13.0	9.0	8.0	13.5	8.5	9.5	11.5	18.0
8.2	12.6	8.2	8.8	15.2	6.0	11.2	13.1	6.7	7.2	11.8	11.0	5.1	11.1	14.8	1.9	10.0	18.1	2.8	9.5	12.9
8.8	15.6	5.4	10.6	14.3	6.1	13.1	14.1	5.7	13.2	10.5	6.3	8.4	10.9	6.7	9.8	8.8	11.5	5.2	12.6	13.3
8.2	16.3	7.5	9.9	16.4	4.7	9.8	15.7	5.5	8.5	14.5	7.2	6.8	13.2	11.0	5.4	11.7	12.9	9.9	11.5	9.6
9.7	13.7	6.5	9.0	14.3	7.7	8.6	15.1	7.3	11.9	10.5	7.6	15.3	12.2	7.5	11.0	10.2	8.9	9.9	11.3	12.0
7.5	14.1	8.2	7.8	16.4	6.8	8.8	16.0	6.8	11.0	11.3	7.7	12.6	9.6	8.8	11.0	9.8	9.4	8.3	17.8	5.4
10.0	13.7	7.3	9.9	16.3	5.4	11.1	13.4	5.0	10.0	14.0	6.0	7.3	13.3	10.4	4.9	16.3	9.4	5.4	8.9	18.7
6.4	10.3	6.1	11.0	13.9	7.5	12.5	11.0	6.5	10.2	12.9	18.3	6.5	11.2	15.4	8.1	11.0	10.9	5.8	11.2	14.0
6.2	17.5	6.2	8.5	15.9	6.8	11.1	13.9	5.0	12.1	11.5	6.8	12.5	11.2	7.3	9.9	11.4	8.7	8.7	11.8	10.5
9.9	13.4	8.7	8.0	15.4	7.6	10.7	12.5	7.8	10.1	10.5	8.3	10.6	12.3	7.3	10.1	10.9	9.0	9.4	12.7	8.9
9.8	13.7	6.5	8.8	15.2	7.0	10.4	12.7	8.8	10.7	10.6	8.7	12.5	12.0	6.5	9.5	10.2	10.3	7.4	12.0	11.6
10.0	16.0	6.0	7.8	17.0	6.2	7.8	18.4	6.8	10.4	12.9	9.0	10.2	12.8	8.0	8.4	11.5	10.1	6.2	12.8	12.0
7.9	15.3	7.4	7.5	15.5	8.0	9.8	12.4	8.8	8.8	12.1	9.1	10.2	13.7	9.6	7.7	11.2	9.8	9.0	11.8	9.1
9.5	12.9	7.5	8.5	14.6	8.0	9.1	13.5	8.4	10.6	10.4	9.0	13.7	9.6	7.7	11.2	9.8	9.0	10.1	11.8	9.1
8.2	17.4	4.0	10.4	16.1	4.5	12.8	14.9	3.3	12.9	13.1	4.0	12.0	13.4	5.6	10.2	15.7	4.1	10.0	14.6	6.4
6.2	17.8	13.0	11.0	16.2	7.4	10.1	14.8	6.6	9.5	11.8	11.7	2.8	12.1	16.1	2.8	9.6	18.1	1.9	6.7	22.4
8.2	13.0	8.8	10.6	15.4	6.0	11.5	13.2	6.3	13.2	10.1	6.7	12.9	10.5	7.6	10.8	10.9	8.3	9.2	12.4	9.4
8.0	13.1	8.9	9.3	14.5	7.2	9.0	18.5	3.5	12.0	14.0	11.1	5.5	10.0	15.5	1.6	6.7	21.7	0.6	5.4	25.0
8.5	19.6	2.5	8.0	19.5	3.5	9.8	15.0	2.2	13.8	10.5	4.0	6.5	18.0	6.5	8.0	12.5	9.5	9.0	13.0	9.0
12.0	13.0	2.0	10.5	14.0	6.5	9.8	15.0	5.7	13.0	10.5	5.7	13.0	10.5	7.5	9.0	11.2	9.8	9.0	11.6	10.4
8.2	14.0	7.8	9.7	13.4	7.9	10.8	9.8	10.4	10.7	10.8	8.5	11.2	11.7	8.1	9.0	11.0	10.0	6.1	12.8	12.1
11.0	15.8	2.2	6.7	17.4	6.9	6.7	18.1	6.2	13.3	13.0	8.7	15.0	11.4	4.6	14.1	10.0	5.9	12.8	14.0	4.7
7.0	16.4	4.6	8.3	16.5	6.2	9.8	15.2	6.0	8.5	13.9	7.6	7.7	13.9	9.4	4.8	12.3	12.9	2.2	12.5	16.3
7.8	14.1	8.1	8.9	15.8	6.3	9.6	14.6	6.8	8.1	14.5	7.4	5.3	13.3	12.4	3.6	11.7	14.7	1.8	10.1	19.1
7.8	13.8	8.4	8.6	14.2	8.2	11.4	12.2	7.4	10.2	11.1	8.7	8.9	11.5	10.6	9.1	10.6	10.3	9.0	12.7	9.3
7.2	9.5	13.0	15.3	7.4	3.2	14.5	9.5	3.3	12.4	9.5	8.1	7.1	9.9	14.0	4.7	8.8	16.5	8.9	7.8	19.3
25.3	4.0	0.7	15.3	11.9	4.5	13.0	12.8	5.2	25.3	4.7	1.0	23.9	6.1	1.0	22.6	6.4	1.0	19.8	8.9	2.8
9.5	17.5	3.0	10.0	16.5	4.5	13.5	13.5	4.0	6.0	14.5	9.5	9.0	13.0	9.0	7.0	13.5	9.5	5.0	14.5	11.5
25.0	4.2	0.8	27.3	8.5	0.2	28.8	2.6	0.1	25.4	3.6	1.0	21.0	7.1	2.9	18.9	5.9	4.2	12.5	10.2	8.3
14.2	11.0	4.8	13.7	12.3	5.0	11.6	12.8	6.6	14.7	12.2	3.1	13.2	11.5	6.3	11.3	8.2	10.5	9.7	10.0	11.3
7.6	12.6	9.8	9.2	14.7	7.1	11.0	13.7	6.9	8.3	12.3	8.9	6.5	10.9	13.6	2.9	9.3	17.2	0.9	6.8	23.3
12.3	0.7	8.0	18.8	9.0	3.2	10.7	7.8	2.5	17.0	8.0	5.0	6.7	13.2	11.1	2.5	13.0	14.5	2.0	10.7	18.3
25.8	8.7	0.5	29.7	1.1	0.2	29.6	1.4	0.0	25.7	8.7	0.6	23.0	5.7	2.3	19.5	6.4	4.1	13.3	8.0	9.7
8.0	14.4	7.6	11.4	12.9	6.7	14.1	13.2	3.7	13.9	10.9	5.2	12.8	11.8	6.4	7.7	12.2	10.1	7.2	11.2	12.6
2.1	10.4	16.5	8.3	7.5	20.2	1.7	6.0	23.3	2.1	7.7	20.2	2.0	8.2	20.8	6.7	8.7	14.6	9.1	9.9	12.0
8.2	15.2	6.6	10.6	15.8	4.6	10.5	14.8	5.7	9.1	13.8	7.1	10.4	12.2	8.4	6.5	13.7	9.8	8.8	12.8	9.4
10.0	11.0	4.0	10.7	16.3	4.0	10.3	13.7	3.3	11.0	13.3	5.7	6.8	10.0	14.2	5.5	15.8	8.7	9.2	16.8	5.0
15.4	11.4	8.2	15.3	12.3	2.9	16.6	10.2	1.2	19.0	9.5	2.5	12.5	11.7	6.8	10.0	10.9	9.1	8.3	10.2	12.5
6.7	15.3	8.1	8.2	16.1	6.7	9.4	16.9	4.7	11.7	13.9	4.4	12.8	12.6	5.6	13.5	10.0	6.5	13.2	11.2	6.6
9.3	14.2	7.8	11.2	14.0	5.8	11.0	13.7	6.3	10.7	12.7	6.6	8.7	12.0	10.3	4.3	12.1	13.6	2.6	9.6	18.8
8.3	14.3	7.5	8.7	15.1	7.2	10.6	12.5	6.9	9.5	11.9	8.6	10.5	12.8	7.7	9.2	11.3	9.5	7.2	13.6	10.2
12.6	11.2	6.2	7.7	15.7	7.6	9.7	14.4	6.9	12.4	13.1	4.5	15.4	11.4	4.2	15.0	9.4	5.6	13.1	9.6	8.3
7.2	15.7	7.1	9.2	15.9	5.9	7.3	15.2	8.5	8.4	11.8	9.8	11.7	11.9	7.4	9.9	11.2	8.9	10.5	10.8	9.7
9.2	14.5	6.3	15.0	14.0	2.0	17.7	10.5	2.8	14.8	11.5	3.7	7.2	14.3	9.5	8.8	14.0	7.2	8.0	14.8	8.2
10.2	16.1	4.7	11.2	15.2	4.6	13.1	14.9	3.0	14.6	9.6	5.8	14.3	11.1	5.6	10.8	9.8	9.4	10.0	9.4	11.6
14.3	13.6	2.7	11.1	13.8	7.9	16.2	12.3	2.5	14.9	10.3	4.8	13.8	11.5	5.7	11.2	11.3	7.5	10.3	11.3	9.4
7.5	6.6	16.2	3.0	10.3	17.7	8.2	9.8	13.0	8.5	7.0	14.5	8.0	9.2	13.8	3.3	7.2	19.5	5.0	10.0	16.0
10.5	13.3	6.3	9.4	14.2	7.4	8.4	13.2	8.4	10.2	10.2	9.6	11.1	10.9	9.0	5.5	11.8	9.2	9.9	11.8	9.3
10.0	12.9	7.7	11.6	11.0	4.0	20.0	9.0	2.0	16.3	9.4	4.3	5.3	12.3	13.4	3.8	11.0	13.7	5.7	11.0	14.3
6.8	15.7	7.5	14.8	12.6	3.6	12.8	15.4	2.8	14.8	11.0	4.2	10.6	12.2	8.2	8.8	12.8	8.4	6.2	12.6	12.2
16.0	11.4	2.6	13.6	12.8	3.6	17.1	11.6	2.3	17.3	8.9	3.8	18.4	8.1	4.5	18.6	5.4	6.0	18.0	7.4	5.6
25.3	8.3	1.2	9.5	16.8	4.7	10.5	16.8	3.7	20.0	7.5	2.5	21.5	6.5	3.0	19.8	8.5	1.7	17.2	9.5	4.3
7.3	14.8	7.9	9.8	14.8	6.4	11.8	12.5	6.7	10.4	11.8	7.8	8.5	11.5	11.0	4.8	11.4	13.8	3.0	10.9	17.0
0.7	4.0	25.3	1.3	7.3	22.4	2.7	6.0	22.3	1.0	8.2	25.8	1.2	5.0	24.8	0.8	5.5	23.7	1.0	5.0	25.0
9.9	15.3	4.8	10.0	14.9	6.1	10.2	16.1	4.7	12.0	11.2	6.8	14.3	10.1	6.6	9.5	11.1	9.4	8.8	10.2	12.0
7.8	15.7	6.5	9.1	14.2	7.7	9.3	13.1	8.6	10.8	10.5	8.7	11.5	11.1	8.4	8.4	12.6	9.0	7.9	12.9	10.2
12.5	12.0	8.5	9.5	15.0	6.5	13.0	13.0	5.0	16.0	10.5	8.5	15.2	10.2							

## APPENDIX 66.

*Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, during each month of the year ending June 30, 1884.*

[Copied from the records on file at the office of the chief engineer, Central Pacific Railroad, by the observer at San Francisco, Cal.]

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Alta, Cal	(1)	(1)	SE.	S.	S.	S.	S.	SE.	S.	NE.	S.	S.
Anaheim, Cal	SW.	SW.	SW.	SW.	SW.	W.	N.	W.	SE.	SW.	SW.	SW.
Antioch, Cal	NW.	W.	W.	W.	W.	SE.	SE.	NW.	W.	W.	W.	W.
Auburn, Cal	SW.	S.	S.	SE.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Battle Mountain, Nev.	SW.	SW.	SW.	W.	SW.	(1)	SW.	SW.	NE.	NE.	SW.	SW.
Benson, Ariz.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Beowawe, Nev.	NW.	NW.	(1)	W.	W.	S.	S.	S.	S.	S.	S.	S.
Bishop's Creek, Nev.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	N.	N.	S.	S.
Blue Creek, Utah	NW.	SW.	N.	N.	E.	E.	E.	SW.	S.	S.	NE.	NE.
Boca, Cal	W.	W.	(1)	W.	W.	N.	N.	SW.	N.	SW.	SW.	SW.
Borden, Cal	NW.	NW.	NW.	NW.	NW.	NW.	SE.	SE.	SE.	(SE)	NW.	NW.
Brentwood, Cal	W.	W.	W.	W.	W.	S.	NW.	W.	W.	W.	W.	W.
Brighton, Cal	SW.	S.	SW.	N.	N.	SE.	N.	N.	SE.	SE.	S.	S.
Brown's, Nev.	SW.	W.	W.	W.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Byron, Cal	W.	W.	NW.	W.	W.	W.	NW.	W.	SE.	W.	NW.	NW.
Caliente, Cal	E.	W.	N.	N.	E.	(1)	W.	SE.	W.	W.	W.	W.
Callistoga, Cal	W.	NW.	SE.	W.	S.	E.	SE.	W.	W.	W.	W.	W.
Camp Wright, Cal	(1)	(1)	(1)	NW.	(1)	SE.	(1)	(1)	(1)	(1)	(1)	(1)
Carlin, Nev.	W.	W.	W.	W.	W.	W.	N.	W.	W.	W.	W.	W.
Casa Grande, Ariz.	W.	W.	(1)	W.	E.	E.	E.	W.	W.	SW.	N.	N.
Chico, Cal	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.	S.	S.
Chualar, Cal	N.	N.	N.	N.	N.	N.	S.	S.	S.	N.	N.	N.
Cisco, Cal	(1)	(1)	(1)	SW.	N.	N.	SW.	SW.	SW.	SW.	NE.	SW.
Colfax, Cal	N.	W.	S.	N.	N.	NE.	N.	S.	SW.	SW.	SW.	SW.
Colton, Cal	SW.	W.	SW.	SW.	NE.	(1)	N.	SE.	W.	W.	W.	SW.
Corinne, Utah	N.	S.	N.	N.	N.	N.	N.	N.	S.	N.	W.	W.
Daggett, Ariz.	(1)	(1)	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Davis, Cal	S.	SW.	S.	W.	N.	N.	N.	N.	S.	S.	W.	W.
Delano, Cal	NW.	N.	N.	W.	W.	S.	S.	SW.	SW.	SW.	W.	W.
Deming, N. Mex.	SW.	SE.	SW.	SW.	SW.	SW.	E.	W.	W.	W.	W.	W.
Dunnigan, Cal	SE.	N.	S.	N.	N.	N.	N.	N.	S.	N.	N.	N.
Elko, Nev.	N.	N.	W.	NW.	NW.	N.	N.	N.	W.	N.	N.	N.
El Paso, Tex.	S.	N.	W.	W.	N.	N.	N.	W.	S.	S.	S.	(1)
Emigrant Gap, Cal.	E.	E.	E.	E.	E.	E.	E.	E.	S.	S.	E.	E.
Farmington, Cal	NW.	NW.	NW.	NW.	SE.	NW.	SE.	SE.	SE.	SE.	NW.	NW.
Fenner, Cal	(1)	E.	E.	E.	E.	W.	SW.	W.	E.	E.	W.	W.
Fresno, Cal	NW.	NW.	NW.	NW.	N.	(1)	SE.	SE.	SE.	N.	N.	NW.
Galt, Cal	W.	NW.	NW.	W.	N.	E.	SE.	SE.	SE.	SE.	NW.	NW.
Gilroy, Cal	W.	SW.	N.	W.	N.	N.	N.	W.	SW.	W.	W.	W.
Golconda, Nev.	W.	NW.	W.	W.	E.	W.	F.	SW.	W.	E.	NW.	NW.
Goshen, Cal	NW.	NW.	NW.	NW.	NW.	(1)	SE.	SE.	SW.	SW.	NW.	NW.
Halleck, Nev.	(1)	SW.	W.	SW.	SW.	W.	S.	SW.	SW.	SW.	SW.	SW.
Hawley, Nev.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	N.	(1)	(1)	(1)
Hawthorn, Nev.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	NW.	W.	NW.	NW.
Hollister, Cal	W.	W.	W.	SE.	NW.	SW.	NW.	NW.	NW.	NW.	NW.	NW.
Hot Springs, Nev.	NE.	SE.	NE.	NW.	NE.	NE.	NW.	(1)	N.	N.	N.	N.
Humboldt, Nev.	N.	S.	S.	N.	S.	N.	SW.	N.	N.	N.	SW.	N.
Indio, Cal	NW.	(1)	NW.	NW.	NW.	(1)	N.	SW.	(1)	NW.	NW.	NW.
Ione, Cal	SW.	(1)	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	(1)	N.
Keeler, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	S.	S.
Keene, Cal	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.
Kelton, Utah	N.	S.	E.	S.	N.	S.	N.	S.	S.	N.	N.	N.
Kingsburg, Cal	(1)	(1)	(1)	(1)	(1)	(1)	SE.	SE.	SE.	N.	N.	N.
Knight's Landing, Cal	S.	(1)	S.	N.	N.	S.	N.	N.	N.	S.	S.	S.
Lathrop, Cal	W.	W.	NW.	NW.	W.	SW.	SE.	SE.	SE.	SE.	W.	W.
Lemoore, Cal	NW.	(1)	NW.	NW.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.
Livermore, Cal.	SW.	SW.	SW.	SW.	NE.	SW.	E.	SW.	SW.	SW.	W.	W.

<sup>1</sup>No record.

<sup>2</sup>Record incomplete.

*Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.*

Stations.	1883.						1884.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Loma Prieta, Cal.....	(1)	(1)	(1)	(1)	(1)	(1)	N.	NE.	NE.	E.	E.	(1)
Lordsburg, N. Mex.....	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SW.	SW.	SE.
Los Angeles, Cal.....	SW.	SW.	SW.	SW.	SW.	SW.	NW.	SW.	SE.	SW.	SW.	SW.
Manmoth Tank, Cal.....	E.	(1)	W.	W.	W.	N.	NE.	NE.	SW.	SW.	SW.	NE.
Maricopa, Ariz.....	W.	(1)	W.	(1)	E.	W.	(1)	W.	W.	W.	W.	E.
Martinez, Cal.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	SW.	SW.	SW.	SW.
Marysville, Cal.....	S.	(1)	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Menlo Park, Cal.....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Merced, Cal.....	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Modesto, Cal.....	W.	W.	N.	S.	NW.	S.	S.	S.	S.	S.	NW.	NW.
Mojave, Cal.....	NE.	SW.	SW.	SW.	W.	NW.	(1)	NW.	SW.	SE.	SE.	SE.
Monterey, Cal.....	SW.	NW.	NW.	NW.	NW.	NW.	SE.	NW.	S.	NW.	NW.	NW.
Napa, Cal.....	W.	W.	W.	W.	SW.	W.	NW.	SE.	W.	W.	W.	SW.
Needles, Ariz.....	(1)	(1)	E.	S.	SW.	NW.	NW.	S.	NW.	NW.	SE.	SE.
Newhall, Cal.....	SE.	SE.	SE.	SE.	SE.	SE.	NE.	SE.	SE.	SE.	SE.	SE.
Niles, Cal.....	NW.	W.	W.	SW.	W.	NE.	SE.	NE.	SW.	SE.	W.	SW.
Oakland, Cal.....	W.	W.	W.	W.	W.	W.	S.	W.	W.	W.	W.	W.
Ogden, Utah.....	E.	S.	E.	S.	S.	S.	S.	S.	E.	S.	S.	S.
Orland, Cal.....	S.	S.	S.	N.	N.	S.	N.	N.	S.	S.	S.	S.
Otego, Nev.....	SW.	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Pajaro, Cal.....	W.	W.	(1)	SW.	E.	(1)	(1)	E.	SW.	(1)	W.	S.
Palmdale, Nev.....	W.	W.	W.	NW.	N.	(1)	W.	W.	N.	N.	W.	W.
Pantana, Ariz.....	W.	E.	E.	NW.	E.	E.	E.	E.	E.	E.	E.	(1)
Petaluma, Cal.....	W.	NW.	W.	W.	W.	SE.	SE.	W.	W.	W.	W.	W.
Pleasanton, Cal.....	S.	S.	S.	S.	S.	(1)	S.	S.	S.	S.	SW.	S.
Promontory, Utah.....	SW.	SW.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.	SW.
Ravenna, Cal.....	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.	SW.	SW.	SW.
Red Bluff, Cal.....	S.	S.	N.	N.	N.	S.	N.	N.	S.	S.	S.	S.
Redding, Cal.....	NW.	NW.	NW.	NW.	NW.	(1)	(1)	(1)	SW.	SW.	SW.	SW.
Reno, Nev.....	W.	W.	W.	NW.	W.	W.	E.	SW.	SW.	SW.	N.	SW.
Rocklin, Cal.....	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Sacramento, Cal.....	S.	S.	S.	S.	N.	N.	N.	S.	S.	S.	S.	S.
Salinas City, Cal.....	W.	W.	W.	W.	W.	W.	S.	S.	S.	S.	W.	S.
San Fernando, Cal.....	S.	S.	S.	S.	N.	N.	S.	S.	S.	S.	S.	(1)
San José, Cal.....	NW.	NW.	NW.	NW.	NW.	NW.	S.	S.	NW.	NW.	NW.	NW.
San Mateo, Cal.....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
San Simon, Ariz.....	W.	E.	E.	E.	E.	E.	E.	E.	W.	W.	W.	W.
Santa Cruz, Cal.....	SW.	SE.	SE.	SW.	NE.	NE.	NE.	NE.	N.	N.	S.	S.
Soledad, Cal.....	NW.	NW.	NW.	NW.	NW.	NW.	S.	S.	NW.	NW.	NW.	NW.
Soquel, Cal.....	(1)	S.	(1)	S.	N.	N.	N.	N.	N.	N.	N.	N.
Soquel, Cal.....	(1)	(1)	S.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
South Vallejo, Cal.....	SW.	SW.	SW.	SW.	E.	E.	SE.	SW.	SE.	W.	SW.	SW.
Spadra, Cal.....	W.	W.	W.	W.	W.	W.	N.	E.	S.	W.	W.	N.
Stockton, Cal.....	W.	W.	NW.	NW.	NW.	(1)	SE.	SE.	S.	SE.	W.	NW.
Suisun, Cal.....	SW.	SE.	SW.	W.	SW.	SW.	NE.	NE.	SW.	SW.	SW.	SW.
Summit, Cal.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Sumner, Cal.....	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Teoma, Nev.....	SW.	W.	NE.	NW.	W.	SW.	W.	W.	W.	SW.	W.	W.
Tehama, Cal.....	S.	S.	N.	N.	N.	N.	N.	N.	N.	S.	(1)	S.
Tubicupa, Cal.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.
Tunnant, Cal.....	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Torrace, Utah.....	NW.	(1)	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.	W.
Texas Hill, Ariz.....	SW.	SW.	SE.	SW.	(1)	NW.	N.	S.	W.	W.	W.	W.
Toano, Nev.....	S.	S.	N.	S.	W.	S.	S.	S.	SW.	S.	S.	W.
Tracy, Cal.....	W.	W.	W.	W.	W.	S.	S.	W.	S.	W.	W.	W.
Truckee, Cal.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Tucson, Ariz.....	SW.	S.	W.	S.	W.	W.	SW.	W.	E.	SE.	S.	SE.
Tulare, Cal.....	W.	W.	W.	NW.	NW.	NW.	S.	N.	SW.	S.	NW.	NW.
Turlock, Cal.....	NW.	NW.	NW.	NW.	NW.	NW.	SW.	S.	S.	S.	N.	N.
Wadsworth, Nev.....	NW.	NW.	W.	W.	N.	S.	SE.	N.	W.	W.	N.	W.
Wells, Nev.....	W.	SE.	SE.	SW.	SW.	E.	SW.	W.	SW.	S.	SW.	SW.
White Water, Cal.....	W.	W.	W.	W.	W.	E.	E.	E.	W.	W.	W.	W.
Willcox, Ariz.....	E.	E.	E.	W.	N.	N.	N.	W.	W.	W.	W.	W.
Williams, Cal.....	S.	(1)	S.	N.	N.	SW.	N.	N.	S.	S.	S.	S.
Willows, Cal.....	N.	S.	SE.	S.	S.	S.	S.	SE.	S.	S.	S.	S.
Winnemucca, Nev.....	SW.	NW.	SW.	SW.	SW.	N.	NE.	SE.	SW.	SW.	SW.	SW.
Woodland, Cal.....	S.	S.	N.	N.	N.	N.	N.	N.	N.	N.	S.	S.
Yuma, Ariz.....	SE.	SE.	NE.	NE.	N.	NE.	NE.	NE.	W.	W.	NW.	(1)

<sup>1</sup> No record.

<sup>2</sup> Record incomplete.

## APPENDIX 67.

Table showing the date of the first killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains during the fall and winter of 1883-'84.

Stations.	Latitude.	Longitude.	Date.
Key West, Fla.	0	0	
Brownsville, Tex.	24 34	81 49	(5)
Rio Grande City, Tex.	25 53	97 26	Jan. 1
Indianola, Tex.	26 23	96 48	Jan. 4
Sanford, Fla.	28 82	96 21	Jan. 4
Cedar Keys, Fla.	28 48	81 23	Jan. 14
Galveston, Tex.	29 8	83 2	Dec. 14
New Orleans, La.	29 18	94 47	Jan. 1
Jacksonville, Fla.	29 58	81 20	Dec. 14
Pensacola, Fla.	30 20	90 4	Dec. 14
Fort Davis, Tex.	30 25	87 13	Dec. 14
Mobile, Ala.	30 38	103 56	Dec. 14
Fort Stockton, Tex.	30 41	88 2	Dec. 14
Fort Concho, Tex.	30 53	102 53	Dec. 14
Palestine, Tex.	31 25	100 24	Dec. 14
El Paso, Tex.	31 45	95 40	Nov. 14
Savannah, Ga.	31 47	106 30	Nov. 14
Vicksburg, Miss.	32 5	81 5	Dec. 14
Montgomery, Ala.	32 22	90 53	Nov. 14
Shreveport, La.	32 23	96 18	Nov. 14
Charleston, S. C.	32 30	93 40	Nov. 14
Augusta, Ga.	32 47	79 56	Nov. 14
Atlanta, Ga.	32 38	81 54	Nov. 14
Smithville, N. C.	33 45	84 22	Nov. 14
Wilmington, N. C.	33 55	78 1	Dec. 14
Fort Sill, Ind. T.	34 14	77 57	Nov. 14
Fort Macon, N. C.	34 40	96 23	(4)
Little Rock, Ark.	34 42	76 40	Nov. 14
Chattanooga, Tenn.	34 45	92 6	Nov. 14
Memphis, Tenn.	35 4	85 15	Nov. 14
Charlotte, N. C.	35 9	90 3	Nov. 14
Hatteras, N. C.	35 13	80 51	Nov. 14
Fort Smith, Ark.	35 15	75 40	Dec. 14
Fort Elliott, Tex.	35 22	94 24	Nov. 14
Knoxville, Tenn.	35 30	100 21	Oct. 14
Kitty Hawk, N. C.	35 56	83 58	Nov. 14
Nashville, Tenn.	36 0	75 42	Nov. 14
Norfolk, Va.	36 10	86 47	Nov. 14
Cape Henry, Va.	36 51	76 17	Nov. 14
Cairo, Ill.	36 56	76 0	Dec. 14
Lynchburg, Va.	37 0	80 10	Nov. 14
Dodge City, Kans.	37 25	79 9	Nov. 14
Chincoteague, Va.	37 45	100 0	Oct. 14
West Las Animas, Colo.	37 55	75 23	Nov. 14
Louisville, Ky.	38 4	103 12	Oct. 14
Saint Louis, Mo.	38 15	85 45	Nov. 14
Delaware Breakwater, Del.	38 38	90 13	Nov. 14
Pike's Peak, Colo.	38 48	75 10	Nov. 14
Washington, City	38 50	105 2	Aug. 14
Cape May, N. J.	38 54	77 2	Nov. 14
Cincinnati, Ohio	38 56	74 58	Nov. 14
Baltimore, Md.	39 6	84 30	Nov. 14
Leavenworth, Kans.	39 18	76 37	Nov. 14
Atlantic City, N. J.	39 19	94 57	Oct. 14
Denver, Colo.	39 22	74 25	Nov. 14
Barnegat City, N. J.	39 45	105 0	Sept. 14
Indianapolis, Ind.	39 46	74 6	Nov. 14
Springfield, Ill.	39 46	86 10	Dec. 14
Philadelphia, Pa.	39 48	80 30	Oct. 14
Columbus, Ohio	39 57	75 9	Nov. 14
Keokuk, Iowa	39 58	83 0	Nov. 14
Sandy Hook, N. J.	40 23	81 30	Oct. 14
Pittsburg, Pa.	40 28	74 0	Nov. 14
New York City	40 23	80 2	Nov. 14
Cheyenne, Wyo.	40 43	74 0	Nov. 14
North Platte, Nebr.	41 8	104 40	Sept. 14
Block Island, R. I.	41 8	100 45	Oct. 14
	41 10	71 30	Nov. 14

<sup>1</sup> None observed.

<sup>2</sup> No reliable record.

<sup>3</sup> Date when temperature first fell to freezing point; no killing frost reported.

Table showing the date of the first killing frost, &amp;c.—Continued.

Stations.	Latitude.		Longitude.		Date.	
	°	'	°	'		
Omaha, Nebr.....	41	16	95	56	Oct.	29
New Haven, Conn.....	41	18	72	56	Oct.	5
New London, Conn.....	41	21	72	5	Oct.	5
Sandusky, Ohio.....	41	25	82	40	Oct.	27
Cleveland, Ohio.....	41	30	81	42	Oct.	17
Davenport, Iowa.....	41	30	90	38	Oct.	8
Des Moines, Iowa.....	41	35	93	37	Oct.	20
Columbo, Ohio.....	41	40	83	34	Sept.	9
Chicago, Ill.....	41	52	87	38	Oct.	1
Provincetown, Mass.....	42	3	70	11	Oct.	17
Eric, Pa.....	42	7	80	5	Oct.	1
Detroit, Mich.....	42	20	89	3	Oct.	1
Boston, Mass.....	42	21	71	4	Oct.	8
Dubuque, Iowa.....	42	30	90	44	Sept.	28
Albany, N. Y.....	42	39	73	45	Oct.	16
Buffalo, N. Y.....	42	53	78	53	Oct.	1
Frankton, Dak.....	42	54	97	28	Oct.	2
Fort Huron, Mich.....	43	0	82	26	Sept.	28
Milwaukee, Wis.....	43	2	87	54	Oct.	1
Grand Haven, Mich.....	43	5	86	18	Sept.	10
Cochester, N. Y.....	43	8	77	42	(?)	
Lawego, N. Y.....	43	29	76	35	Oct.	1
Portland, Me.....	43	29	70	15	Nov.	1
La Crosse, Wis.....	43	49	91	15	Oct.	1
Mount Washington, N. H.....	44	16	71	18	Sept.	8
Huron, Dak.....	44	31	98	9	Sept.	8
Deadwood, Dak.....	44	28	108	43	Sept.	21
Fort Bennett, Dak.....	44	43	100	39	Oct.	14
Eastport, Me.....	44	54	66	59	Oct.	2
Saint Paul, Minn.....	44	58	98	8	Sept.	30
Alpena, Mich.....	45	5	83	30	Sept.	10
Fort Custer, Mont.....	45	42	107	34	Oct.	11
MacKinnaw City, Mich.....	45	47	84	39	Sept.	29
Escanaba, Mich.....	45	48	87	5	Sept.	28
Helena, Mont.....	46	34	112	4	Sept.	20
Marquette, Mich.....	46	34	87	24	Sept.	28
Bismarck, Dak.....	46	47	100	38	Sept.	8
Duluth, Minn.....	46	48	92	6	Oct.	21
Moorhead, Minn.....	46	52	96	44	Sept.	8
Fort Shaw, Mont.....	47	31	111	48	Aug.	22
Fort Benton, Mont.....	47	50	110	40	Sept.	20
Fort Buford, Dak.....	48	0	108	56	Aug.	22
Poplar River, Mont.....	48	8	105	10	Sept.	23
Fort Assiniboine, Mont.....	48	33	109	43	Sept.	20
Saint Vincent, Minn.....	48	56	97	14	Sept.	8

1 Date when temperature first fell to freezing point; no killing frost reported.

2 No reliable record.



## APPENDIX 68.

Table showing the first frost at stations of the Signal Service, United States Army, east of the Rocky Mountains, for each winter from the commencement of observations to the winter of 1883-'84.

Stations.	Latitude.	Longitude.	WINTER OF—													1883-'84.
			1871-'72.	1872-'73.	1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.		
Key West, Fla.	24 24	81 49	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Brownsville, Tex.	25 53	97 26														
Rio Grande City, Tex.	26 23	98 48														
Indianola, Tex.	28 32	96 41	( <sup>1</sup> )		Jan. 7	Jan. 9	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Sanford, Fla.	28 46	81 23														
Cedar Keys, Fla.	29 8	83 2														
Galveston, Tex.	29 18	94 47	Jan. 24	Dec. 24	Jan. 5	Jan. 9	( <sup>1</sup> )	Dec. 2	Nov. 30	Jan. 4	( <sup>1</sup> )	Dec. 20	Dec. 29	Dec. 17	Dec. 16	
New Orleans, La.	29 58	90 4	Dec. 1	Nov. 30	Nov. 26	Nov. 28	Dec. 18	Nov. 21	Nov. 11	Nov. 1	( <sup>1</sup> )	Nov. 10	Nov. 25	Dec. 16	Dec. 16	
Jacksonville, Fla.	30 20	81 32	Dec. 6	Nov. 16	Nov. 13	Dec. 8	Oct. 28	Nov. 20	Nov. 12	Nov. 23	Nov. 29	Nov. 16	Nov. 4	Nov. 15	Nov. 3	
Pensacola, Fla.	30 25	87 13														
Fort Davis, Tex.	30 38	103 56														
Mobile, Ala.	30 41	88 2	Dec. 5	Nov. 15	Oct. 26	Oct. 14	Dec. 8	Oct. 2	Nov. 11	Nov. 3	( <sup>1</sup> )	Oct. 27	Oct. 7	Nov. 25	Nov. 22	
Fort Stockton, Tex.	30 53	102 53														
Fort Concho, Tex.	31 25	100 24														
Palestine, Tex.	31 45	95 40														
El Paso, Tex.	31 47	106 30														
Savannah, Ga.	32 5	81 5	( <sup>1</sup> )	Oct. 15	Nov. 14	Oct. 15	Oct. 17	Nov. 21	Nov. 10	Oct. 20	Nov. 4	Oct. 25	Oct. 17	Nov. 15	Nov. 3	
Vicksburg, Miss.	32 23	90 53	Nov. 15	Oct. 7	Nov. 23	Nov. 2	Oct. 17	Nov. 20	Nov. 7	Oct. 19	Oct. 25	Oct. 17	Nov. 4	Nov. 14	Nov. 2	
Montgomery, Ala.	32 33	86 18		Oct. 15	Oct. 28	Nov. 1	Oct. 12	Nov. 10	Nov. 4	Oct. 19	Nov. 3	Oct. 24	Nov. 4	Nov. 14	Nov. 26	
Shreveport, La.	32 30	93 40	Nov. 15	Oct. 18	Oct. 20	Nov. 1	Oct. 15	Oct. 1	Oct. 20	Oct. 18	Nov. 18	Oct. 17	Nov. 20	Nov. 14	Oct. 26	
Charleston, S. C.	32 47	79 56	Nov. 17	( <sup>1</sup> )	Oct. 8	Nov. 30	Dec. 10	Oct. 2	Nov. 11	Nov. 29	Nov. 21	Nov. 16	Nov. 28	Nov. 22	Nov. 3	
Augusta, Ga.	32 28	81 54	Nov. 16	( <sup>1</sup> )	Oct. 8	Oct. 14	Nov. 1	Oct. 2	Nov. 11	Oct. 19	Nov. 1	Oct. 24	Nov. 4	Nov. 15	Nov. 2	
Atlanta, Ga.	33 45	84 23														
Smithville, N. C.	33 55	78 1														
Wilmington, N. C.	34 14	77 57	Nov. 17	Nov. 16	Nov. 20	Nov. 3	Oct. 17	Nov. 26	Nov. 7	Oct. 20	Nov. 4	Oct. 19	Nov. 8	Nov. 13	Nov. 2	
Fort Mill, Ind. T.	34 40	98 23														
Fort Macon, N. C.	34 43	76 40														
Little Rock, Ark.	34 45	92 6														
Chattanooga, Tenn.	35 4	85 15														
Memphis, Tenn.	35 9	90 3														
Hot Springs, N. C.	35 13	80 51														
Charlotte, N. C.	35 25	76 40														
Fort Smith, Ark.	35 32	90 24														
Fort Elliott, Tex.	35 56	100 21														
Kearneyville, Tenn.	36 54	83 54	Sept. 20	Oct. 11	Oct. 7	Oct. 13	Oct. 12	Oct. 2	Oct. 5	( <sup>1</sup> )	Sept. 26	Sept. 18	Oct. 13	Nov. 1	Nov. 10	
Naasville, Tenn.	36 56	84 47	Oct. 14	Oct. 11	Oct. 21	Oct. 14	Oct. 13	Oct. 7	Oct. 12	Nov. 18	Nov. 15	Nov. 12	Nov. 12	Nov. 12	Nov. 1	
	36 56	84 47	Oct. 14	Oct. 11	Oct. 21	Oct. 14	Oct. 13	Oct. 7	Oct. 12	Nov. 18	Nov. 15	Nov. 12	Nov. 12	Nov. 12	Nov. 1	

[illegible]

**Frost every month in the year.**

**No reliable record.**

**No frost observed.**

Table showing the first frost at stations of the Signal Service, United States Army, east of the Rocky Mountains, &amp;c.—Continued.

Stations.	Latitude.	Longitude.	WINTER OF—													
			1871-'72.	1872-'73.	1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.	
Rochester, N. Y.	43 8	77 43	( <sup>1</sup> )	( <sup>1</sup> )	Sept 15	Oct 12	Sept 23	Oct 8	Oct 7	Sept 23	Sept 11	Oct 14	Oct 11	Oct 4	( <sup>1</sup> )	
Oswego, N. Y.	43 29	76 25	( <sup>1</sup> )	Oct 17	Oct 29	Oct 15	Oct 13	Oct 13	Oct 23	Sept 23	Sept 25	Oct 1	Oct 5	Oct 23	Sept 11	
Portland, Me.	43 39	70 15	Oct 20	Oct 29	Oct 20	Oct 22	Oct 2	Oct 2	Oct 7	Sept 16	Sept 23	Aug 27	Oct 5	Oct 23	Sept 27	
La Crosse, Wis.	43 49	91 15	( <sup>1</sup> )	( <sup>1</sup> )	Sept 14	Sept 15	Sept 17	Sept 23	Oct 6	Sept 11	Sept 21	Sept 8	Sept 28	Aug 10	Sept 8	
Mt. Washington, N. H.	44 16	71 18	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 12	Sept 1	Sept 1	
Huron, Dak.	44 21	98 9	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 15	Sept 20	July 17	
Deadwood, Dak.	44 23	103 43	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 2	Sept 22	Sept 14	
Fort Bennett, Dak.	44 43	100 39	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 30	Oct 8	Sept 29	
Eastport, Me.	44 54	66 59	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 7	Oct 3	Sept 11	
Saint Paul, Minn.	44 58	93 3	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 28	Sept 20	Sept 8	
Albena, Mich.	45 5	83 30	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 1	Sept 24	Aug 14	
Fort Custer, Mont.	45 42	107 34	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 7	Sept 21	Aug 14	
MacKinnaw City, Mich.	45 47	84 39	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 10	Sept 10	Sept 10	
Escanaba, Mich.	45 48	87 5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 15	Sept 27	Sept 14	
Helena, Mont.	46 34	112 4	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 6	Sept 23	Aug 14	
Marquette, Mich.	46 34	87 24	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 6	Sept 29	Sept 20	
Bismarck, Dak.	46 47	100 38	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 28	Sept 24	Aug 14	
Duluth, Minn.	46 48	92 6	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 28	Sept 21	Sept 2	
Moorhead, Minn.	46 52	96 44	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 28	Sept 20	Sept 8	
Fort Shaw, Mont.	47 31	111 48	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 6	Sept 19	Sept 5	
Fort Benton, Mont.	47 50	110 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 6	Sept 10	Aug 23	
Fort Buford, Dak.	48 0	103 56	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 6	Sept 21	Aug 23	
Poplar River, Mont.	48 8	105 10	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 5	Sept 23	Aug 23	
Fort Assinaboine, Mont.	48 23	109 42	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 5	Sept 23	Sept 15	
Saint Vincent, Minn.	48 56	97 14	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>2</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Sept 5	Sept 20	Sept 8	

<sup>1</sup> No reliable record.<sup>2</sup> Frost every month in the year.

# APPENDIX 69.

Table showing the last frost at stations of the Signal Service, United States Army, east of the Rocky Mountains, for each winter from the commencement of observations to the winter of 1883-'84.

Stations.	Latitude.	Longitude.	WINTER OF—												
			1871-'72	1872-'73	1873-'74	1874-'75	1875-'76	1876-'77	1877-'78	1878-'79	1879-'80	1880-'81	1881-'82	1882-'83	1883-'84
Key West, Fla.	24 24	81 49	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Brownsville, Tex.	25 53	97 26	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Rio Grande City, Tex.	26 23	98 43	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Indianola, Tex.	28 33	94 31	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Sanford, Fla.	28 48	81 23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Cedar Key, Fla.	29 18	83 42	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Galveston, Tex.	29 18	94 47	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
New Orleans, La.	29 58	90 4	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Jacksville, Fla.	30 20	81 39	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Pensacola, Fla.	30 25	87 13	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Davis, Tex.	30 38	103 54	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Mobil, Ala.	30 41	88 2	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Stockton, Tex.	30 52	103 52	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Concho, Tex.	31 25	102 21	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Delaware, Tex.	31 45	100 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
El Paso, Tex.	31 47	103 30	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Vandalia, Ga.	32 5	81 5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Vicksburg, Miss.	32 22	90 53	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Montgomery, Ala.	32 23	88 18	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Shreveport, La.	32 30	93 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Charleston, S. C.	32 47	79 56	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Augusta, Ga.	33 23	81 54	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Atlanta, Ga.	33 45	84 23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Smithville, N. C.	33 55	78 1	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Wilmington, N. C.	34 14	77 57	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Mill, Ind. T.	34 40	98 23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Macon, N. C.	34 42	76 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Little Rock, Ark.	34 45	92 6	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Chattanooga, Tenn.	35 4	85 15	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Memphis, Tenn.	35 9	90 8	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Charlotte, N. C.	35 13	80 51	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Hatteras, N. C.	35 15	75 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Smith, Ark.	35 23	94 34	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Elliott, Tex.	35 30	100 21	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup> No frost observed.

<sup>2</sup> No reliable record.



### REPORT OF THE CHIEF SIGNAL OFFICER.

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Chicago, Ill.	41	52	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																											
Erie, Pa.	42	20	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Detroit, Mich.	43	21	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	
Boston, Mass.	44	22	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100		
Danbury, Conn.	45	23	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100			
Albany, N. Y.	46	24	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100				
Buffalo, N. Y.	47	25	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100					
Yonkers, N. Y.	48	26	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100						
Port Huron, Mich.	49	27	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100							
Port Huron, Mich.	50	28	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100								
Grand Haven, Mich.	51	29	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100									
Rochester, N. Y.	52	30	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100										
Owego, N. Y.	53	31	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100											
Portland, Me.	54	32	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100												
La Crosse, Wis.	55	33	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100													
Mount Washington, N. H.	56	34	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100														
Huron, Dak.	57	35	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100															
Deadwood, Dak.	58	36	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																
Fort Bennett, Dak.	59	37	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																	
Eastport, Me.	60	38	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																		
Saint Paul, Minn.	61	39	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																			
Albina, Mich.	62	40	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																				
Fort Custer, Mont.	63	41	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																					
Fort Custer, Mont.	64	42	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																						
Fort Custer, Mont.	65	43	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																							
Fort Custer, Mont.	66	44	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																								
Fort Custer, Mont.	67	45	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																									
Fort Custer, Mont.	68	46	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																										
Fort Custer, Mont.	69	47	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	9																														

**No reliable record.**

**No frost observed.**

**Frost every month in the year.**

**4 Station temporarily closed.**

## APPENDIX 70.

Table showing the first snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains, for each winter from the commencement of observations to the winter of 1883-'84.

Stations.	Latitude.	Longitude.	WINTER OF—													
			1871-'72.	1872-'73.	1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.	
Key West, Fla.	24 34	81 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Brownsville, Tex.	25 53	97 26	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Rio Grande City, Tex.	26 23	96 45	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Indianola, Tex.	28 23	96 31	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Sanford, Fla.	28 48	81 23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Cedar Keys, Fla.	29 8	83 2	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Galveston, Tex.	29 18	94 47	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
New Orleans, La.	29 58	90 4	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Jacksonville, Fla.	30 20	81 39	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Pensacola, Fla.	30 25	87 13	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Davis, Tex.	30 36	103 56	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Mobile, Ala.	30 41	88 2	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Stockton, Tex.	30 53	102 53	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Concho, Tex.	31 25	100 24	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Palestine, Tex.	31 45	95 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
El Paso, Tex.	31 47	106 30	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Savannah, Ga.	32 5	81 5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Vicksburg, Miss.	32 22	90 53	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Montgomery, Ala.	32 23	86 18	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Shreveport, La.	32 30	93 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Charleston, S. C.	32 47	79 56	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Charleston, S. C.	33 28	81 54	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Atlanta, Ga.	33 45	84 23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Atlanta, Ga.	33 55	78 1	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Smithville, N. C.	34 14	77 57	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Wilmington, N. C.	34 40	96 23	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Sill, Ind. T.	34 42	76 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Macon, N. C.	34 45	92 6	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Little Rock, Ark.	35 4	85 15	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Chattanooga, Tenn.	35 9	90 3	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Memphis, Tenn.	35 13	80 51	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Charlotte, N. C.	35 15	75 40	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Hatteras, N. C.	35 22	94 24	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Smith, Ark.	35 30	100 21	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Elliott, Tex.	35 56	83 58	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Fort Huachuca, Ariz.	36 0	70 42	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	
Nashville, Tenn.	36 10	86 47	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	

### REPORT OF THE CHIEF SIGNAL OFFICER.

30 51	76 17	(*)	Nov. 28	Dec. 2	Nov. 30	Dec. 1	Nov. 29	Dec. 17	Dec. 28	Nov. 28	Dec. 28
36 56	76 0		Nov. 14	Nov. 18	Jan. 30	Jan. 31	Nov. 29	Dec. 28	Nov. 28	Nov. 28	Dec. 28
37 0	89 10		Nov. 14	Nov. 18	Nov. 24	Dec. 8	Nov. 29	Dec. 17	Nov. 28	Nov. 28	Dec. 28
37 25	79 5		Dec. 8	Dec. 5	Nov. 24	Feb. 4	Nov. 29	Dec. 28	Nov. 28	Nov. 28	Dec. 28
37 45	100 0		Nov. 8	Nov. 5	Nov. 24	Nov. 13	Nov. 30	Dec. 12	Nov. 28	Nov. 28	Dec. 28
37 55	75 23				Nov. 30	Nov. 13	Nov. 30	Dec. 12	Nov. 28	Nov. 28	Dec. 28
38 4	103 12		Dec. 21	Dec. 8	Dec. 7	Dec. 8	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
38 15	85 45		Nov. 14	Nov. 4	Dec. 14	Dec. 7	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
38 38	90 12		Nov. 14	Nov. 4	Dec. 14	Dec. 7	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
38 50	75 10				Dec. 14	Dec. 7	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
38 54	77 2		Nov. 28	Nov. 16	Dec. 14	Dec. 7	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
38 56	74 58		Nov. 28	Nov. 16	Dec. 14	Dec. 7	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 0	84 30	(*)	Nov. 22	Nov. 12	Nov. 28	Nov. 16	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 18	76 37	(*)	Nov. 22	Nov. 29	Nov. 13	Nov. 28	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 19	94 57	(*)	Nov. 23	Nov. 15	Nov. 28	Nov. 16	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 22	74 25	(*)	Nov. 23	Nov. 15	Nov. 28	Nov. 16	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 22	74 25	(*)	Nov. 23	Nov. 15	Nov. 28	Nov. 16	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 45	105 0	(*)	Sept. 24	Oct. 16	Oct. 16	Oct. 16	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 46	74 6	(*)	Nov. 19	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 48	86 10	(*)	Nov. 19	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 48	88 30	(*)	Nov. 19	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 57	75 9	(*)	Nov. 22	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
39 58	83 0	(*)	Nov. 22	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
40 22	91 26	(*)	Nov. 22	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
40 28	74 0	(*)	Nov. 22	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
40 32	80 2	(*)	Nov. 22	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
40 43	74 0	(*)	Nov. 22	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 8	104 48	(*)	Oct. 8	Sept. 24	Oct. 15	Oct. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 8	100 45	(*)	Oct. 8	Sept. 24	Oct. 15	Oct. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 10	71 36	(*)	Nov. 18	Nov. 12	Dec. 3	Nov. 18	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 16	95 56	(*)	Nov. 18	Nov. 12	Dec. 3	Nov. 18	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 18	72 56	(*)	Nov. 10	Nov. 17	Nov. 13	Nov. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 21	72 5	(*)	Nov. 10	Nov. 17	Nov. 13	Nov. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 25	82 40	(*)	Nov. 6	Nov. 15	Oct. 21	Oct. 31	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 30	81 42	(*)	Nov. 6	Nov. 15	Oct. 21	Oct. 31	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 30	90 38	(*)	Nov. 6	Nov. 15	Oct. 21	Oct. 31	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 35	83 37	(*)	Nov. 6	Nov. 15	Oct. 21	Oct. 31	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 40	83 34	(*)	Nov. 6	Nov. 15	Oct. 21	Oct. 31	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
41 52	87 38	(*)	Nov. 22	Nov. 13	Oct. 20	Oct. 29	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 3	70 11	(*)	Nov. 18	Nov. 12	Dec. 3	Nov. 18	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 3	70 11	(*)	Nov. 18	Nov. 12	Dec. 3	Nov. 18	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 7	80 5	(*)	Nov. 18	Nov. 12	Dec. 3	Nov. 18	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 7	80 5	(*)	Nov. 18	Nov. 12	Dec. 3	Nov. 18	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 20	83 2	(*)	Oct. 27	Oct. 20	Nov. 10	Nov. 20	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 21	71 4	(*)	Nov. 10	Nov. 24	Nov. 10	Nov. 20	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 30	90 44	(*)	Nov. 10	Nov. 24	Nov. 10	Nov. 20	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 39	73 45	(*)	Nov. 15	Nov. 15	Nov. 15	Nov. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 53	79 53	(*)	Nov. 15	Nov. 15	Nov. 15	Nov. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
42 54	87 28	(*)	Nov. 15	Nov. 15	Nov. 15	Nov. 15	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
43 0	82 26	(*)	Nov. 10	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
43 2	87 54	(*)	Nov. 10	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
43 5	86 18	(*)	Nov. 10	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28
43 5	86 18	(*)	Nov. 10	Nov. 14	Oct. 27	Oct. 30	Nov. 15	Dec. 6	Nov. 28	Nov. 28	Dec. 28

1 No snow observed.

2 No reliable record.

3 Snow every month.

**Snow every month.**

**No reliable record.**

1



Table showing the first snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains, &amp;c.—Continued.

Stations.	Latitude.		Longitude.		WINTER OF—												
	°	'	°	'	1871-'72	1872-'73	1873-'74	1874-'75	1875-'76	1876-'77	1877-'78	1878-'79	1879-'80	1880-'81	1881-'82	1882-'83	1883-'84
Rochester, N. Y.	43	8	77	42	Nov. 29	Nov. 19	Nov. 1	Oct. 13	Nov. 10	Oct. 5	Nov. 9	Nov. 2	Oct. 24	Sept. 14	Nov. 4	Nov. 13	Nov. 2
Owego, N. Y.	43	29	76	35	Nov. 6	Nov. 16	Oct. 29	Oct. 12	Sept. 19	Oct. 8	Nov. 9	Nov. 5	Oct. 24	Oct. 18	Nov. 8	Nov. 18	Oct. 31
Portland, Me.	43	29	70	15	Nov. 10	Nov. 3	Nov. 12	Nov. 20	Nov. 1	Oct. 15	Oct. 22	Nov. 4	Oct. 24	Nov. 15	Oct. 5	Nov. 8	Nov. 14
La Crosse, Wis.	43	40	91	15	Nov. 4	Nov. 4	Oct. 22	Oct. 30	Oct. 11	Nov. 6	Nov. 1	Oct. 17	Nov. 1	Oct. 16	Nov. 2	Nov. 12	Oct. 13
Mount Washington, N. H.	44	16	71	18	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Sept. 9
Huron, Dak.	44	21	98	9								Sept. 8	Sept. 29	Oct. 9	Oct. 12	Nov. 1	Oct. 20
Deadwood, Dak.	44	23	103	43										Oct. 26	Oct. 23	Nov. 17	Oct. 10
Fort Bennett, Dak.	44	43	100	39										Nov. 4	Nov. 23	Nov. 21	Oct. 20
Eastport, Me.	44	54	66	59										Nov. 4	Oct. 5	Nov. 21	Oct. 14
Saint Paul, Minn.	44	58	93	3	Oct. 10	Nov. 4	Oct. 22	Nov. 20	Nov. 1	Oct. 15	Oct. 22	Oct. 17	Nov. 1	Oct. 16	Nov. 2	Nov. 12	Sept. 28
Albany, Mich.	45	5	83	30				Oct. 14	Sept. 22	Aug. 21	Sept. 21	Sept. 22	Sept. 10	Sept. 22	Oct. 2	Nov. 13	Nov. 13
Fort Custer, Mont.	45	42	107	34										Oct. 9	Sept. 30	Oct. 31	Oct. 9
Mackinaw City, Mich.	45	47	84	39	Oct. 26	Oct. 13	Oct. 21	Oct. 19	Oct. 10	Oct. 4	Oct. 4	Oct. 18	Oct. 23	Oct. 17	Nov. 18	Nov. 13	Oct. 21
Pescanaba, Mich.	45	48	81	5										Oct. 9	Oct. 11	Nov. 8	Oct. 22
Helena, Mont.	46	31	112	4	Oct. 27	Oct. 10	Oct. 2	Oct. 29	Oct. 3	Sept. 29	Sept. 1	Sept. 21	Sept. 24	Oct. 17	Oct. 11	Sept. 28	Oct. 9
Marquette, Mich.	46	34	87	24				Oct. 28	Oct. 10	Nov. 2	Oct. 4	Oct. 8	Oct. 22	Oct. 15	Oct. 14	Oct. 11	Oct. 19
Marquette, Dak.	46	47	100	38	Oct. 28	Nov. 7	Oct. 19	Oct. 20	Oct. 9	Oct. 3	Oct. 30	Oct. 17	Oct. 30	Oct. 16	Oct. 19	Oct. 29	Oct. 12
Duluth, Minn.	46	48	92	6	Oct. 28	Nov. 7	Oct. 19	Oct. 20	Oct. 9	Oct. 3	Oct. 30	Oct. 17	Oct. 30	Oct. 16	Oct. 19	Oct. 29	Oct. 12
Moorehead, Minn.	46	52	96	44	Sept. 25	Oct. 23	Oct. 25	Nov. 7	Oct. 14	Oct. 8	Nov. 1	Oct. 1	Oct. 30	Oct. 15	Oct. 14	Oct. 23	Oct. 13
Fort Snare, Mont.	47	21	111	48										Oct. 6	Sept. 28	Sept. 28	Aug. 21
Fort Benton, Mont.	47	50	110	40										Oct. 14	Oct. 10	Oct. 2	Oct. 11
Fort Buford, Dak.	48	0	103	56										Oct. 9	Oct. 11	Sept. 30	Oct. 11
Poplar River, Mont.	48	8	105	10										Nov. 28	Oct. 9	Sept. 30	Oct. 9
Fort Assiniboine, Mont.	48	32	109	42												Sept. 28	Oct. 9
Saint Vincent, Minn.	48	56	97	14			Sept. 28	Oct. 28	Sept. 19	Oct. 3	Oct. 14	Sept. 20	Oct. 22	Oct. 15	Oct. 12	Oct. 15	Oct. 10

1 Snow every month.

# APPENDIX 71.

Table showing the last snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains, for each winter from the commencement of observations to the winter of 1883-'84.

Stations.	Latitude.		Longitude.		WINTER OF—												
	°	'	°	'	1871-'72.	1872-'73.	1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.
Key West, Fla.	24	24			( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Brownsville, Tex.	25	53							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Rio Grande City, Tex.	26	23							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Indianola, Tex.	28	23			( <sup>1</sup> )	( <sup>1</sup> )	Jan. 5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Sanford, Fla.	28	48							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Cedar Keys, Fla.	29	8							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Galveston, Tex.	29	18					Jan. 5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
New Orleans, La.	29	58			( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Jacksonville, Fla.	30	20			( <sup>1</sup> )	( <sup>1</sup> )		( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Pensacola, Fla.	30	25			( <sup>1</sup> )	( <sup>1</sup> )		( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Davis, Tex.	30	38							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Mobile, Ala.	30	41			Feb. 3	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Stockton, Tex.	30	53							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Concho, Tex.	31	25							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Palestine, Tex.	31	45					Mar. 6	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
El Paso, Tex.	31	47							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
El Paso, Tex.	31	47							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Savannah, Ga.	32	5			( <sup>1</sup> )	( <sup>1</sup> )		( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Vicksburg, Miss.	32	22			Mar. 1	Jan. 28	Mar. 23	Mar. 7	Mar. 20	Jan. 1	Feb. 10	Jan. 9	Feb. 2	Jan. 10	Jan. 8	Jan. 8	Jan. 8
Shreveport, La.	32	23			Mar. 4	Jan. 28	Jan. 16	Dec. 31	Jan. 1	Jan. 1	Jan. 3	Jan. 8	Dec. 25	Jan. 20	Jan. 20	Jan. 20	Jan. 20
Charleston, S. C.	32	47			( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Augusta, Ga.	33	28			Jan. 25	Dec. 11	Feb. 8	( <sup>1</sup> )	Mar. 19	Jan. 1	Jan. 8	Feb. 17	Mar. 12	Jan. 14	Jan. 30	Jan. 29	Jan. 29
Atlanta, Ga.	33	45						( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Dec. 27	Feb. 2	Mar. 29	Jan. 30	Jan. 9	Jan. 9
Smithville, N. C.	33	55						( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Feb. 3	Nov. 17	Jan. 24	Jan. 24	Jan. 24	Jan. 24
Wilmington, N. C.	34	14			Mar. 6	Dec. 27	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Feb. 3	Jan. 19	Nov. 15	Feb. 18	Mar. 0	Feb. 3	Mar. 3
Fort Mill, Ind. T.	34	40						( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Feb. 8	Feb. 14	Mar. 15	Feb. 25	Jan. 18	Mar. 23	Mar. 23
Fort Macon, N. C.	34	42						( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Little Rock, Ark.	34	45							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Chattanooga, Tenn.	35	4							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Memphis, Tenn.	35	9							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Charlotte, N. C.	35	13			Mar. 22	Mar. 25	Apr. 9	Mar. 7	Mar. 19	Mar. 25	Feb. 8	Feb. 16	Apr. 8	Mar. 19	Jan. 31	Mar. 21	Mar. 21
Hatteras, N. C.	35	15							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Smith, Ark.	35	23							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Fort Elliott, Tex.	35	30							( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Knoxville, Tenn.	35	56			Mar. 22	Mar. 26	Apr. 29	Mar. 7	Mar. 28	Mar. 9	Feb. 11	Feb. 18	Feb. 3	Apr. 15	Feb. 18	Feb. 2	Feb. 2
Kitty Hawk, N. C.	36	0					Apr. 18	Apr. 18	Feb. 2	Mar. 18	Dec. 2	Feb. 20	Mar. 30	Apr. 23	Jan. 4	Mar. 23	Jan. 23

\* No reliable record.

† No snow observed.

<sup>1</sup> No snow observed.

<sup>2</sup> No reliable record.

Table showing the last snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains, &amp;c.—Continued.

Stations.	Latitude	Longitude	WINTER OF—												
			1871-'72.	1872-'73.	1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.
Nashville, Tenn.	36 10	86 47	Mar. 22	Mar. 26	Feb. 25	Mar. 22	Mar. 28	Mar. 18	Feb. 10	Mar. 15	Feb. 8	Apr. 4	Feb. 21	Mar. 21	Mar. 2
Norfolk, Va.	36 51	76 17	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	Apr. 16	Mar. 20	Mar. 18	Jan. 8	Feb. 10	Jan. 13	Mar. 81	Mar. 12	Mar. 23	Mar. 5
Cape Henry, Va.	36 56	76 6	Mar. 22	Mar. 25	Apr. 9	Feb. 7	Feb. 4	Mar. 18	Jan. 1	Feb. 10	Jan. 16	Apr. 3	Mar. 4	Jan. 10	Feb. 23
Carlo, Ill.	37 0	89 10	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Lynchburg, Va.	37 25	79 9	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Dodge City, Kans.	37 45	100 0	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Chino, Kans.	37 55	75 23	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
West Las Animas, Colo.	38 4	103 12	Feb. 17	Feb. 23	Jan. 7	Feb. 25	Feb. 15	Feb. 14	Feb. 10	Feb. 17	Feb. 8	Feb. 28	Feb. 21	Apr. 14	Apr. 3
Las Vegas, N. M.	38 15	83 45	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Saint Louis, Mo.	38 38	90 12	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Delaware Breakwater, Del.	38 48	75 10	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Elko's Peak, Colo.	38 50	105 2	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Washington City.	38 54	77 2	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Cape May, N. J.	38 56	74 58	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Cincinnati, Ohio	39 6	84 80	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Baltimore, Md.	39 18	76 37	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Leavenworth, Kans.	39 19	94 57	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Atlantic City, N. J.	39 22	74 25	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Denver, Colo.	39 45	105 0	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Barnegat City, N. J.	39 46	74 6	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Indianapolis, Ind.	39 48	86 10	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Springfield, Ill.	39 53	89 58	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Philadelphia, Pa.	39 58	75 9	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Columbus, Ohio	40 22	83 0	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Kookuk, Iowa	40 22	91 26	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Sandy Hook, N. J.	40 32	74 6	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Pittsburg, Pa.	40 32	80 2	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
New York City	40 43	74 0	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Cheyenne, Wyo.	41 8	104 48	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
North Platte, Nebr.	41 8	100 45	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Rock Island, R. I.	41 10	71 38	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Omaha, Nebr.	41 16	95 56	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
New Haven, Conn.	41 18	72 56	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
New London, Conn.	41 21	72 50	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Cincinnati, Ohio	41 23	82 40	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Cleveland, Ohio	41 30	81 42	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Des Moines, Iowa	41 36	90 37	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Rock Island, Ill.	41 40	83 34	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Keokuk, Iowa	41 40	83 34	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9
Keokuk, Iowa	41 40	83 34	Mar. 22	Mar. 25	Apr. 29	Mar. 17	Mar. 28	Mar. 8	Feb. 30	Mar. 16	Mar. 12	Mar. 30	Jan. 31	Mar. 23	Mar. 9

Detroit, Mich.....	3	3	Apr. 15	Apr. 25	Apr. 30	May 1	May 30	May 1	Mar. 29	Apr. 4	Apr. 14	Apr. 10	Apr. 21	Apr. 10
Boston, Mass.....	71	44	May 3	May 3	Apr. 24	May 19	May 5	Apr. 12	Mar. 25	Apr. 19	Apr. 14	Apr. 10	Apr. 21	Apr. 8
Dubuque, Iowa.....	42	30	.....	.....	Apr. 6	Apr. 18	Apr. 30	Apr. 28	Mar. 5	Apr. 10	Apr. 12	Apr. 12	Apr. 21	Apr. 8
Albany, N. Y.....	42	30	.....	.....	Apr. 29	Apr. 18	Apr. 30	Apr. 5	Apr. 5	Apr. 10	Apr. 12	Apr. 12	Apr. 21	Apr. 8
Buffalo, N. Y.....	43	33	Apr. 25	Apr. 25	Apr. 28	Apr. 17	Apr. 30	Apr. 5	Apr. 25	May 1	Apr. 13	May 1	Apr. 23	Apr. 17
Yankton, Dak.....	42	54	Apr. 23	Apr. 23	Apr. 4	Apr. 11	Apr. 4	Apr. 28	May 11	Apr. 20	Apr. 10	May 18	Apr. 23	Apr. 17
Port Huron, Mich.....	43	0	.....	.....	Apr. 21	Apr. 24	Apr. 30	May 1	Mar. 30	Apr. 5	Apr. 11	May 22	May 22	Apr. 6
Milwaukee, Wis.....	43	2	Apr. 15	Apr. 21	Apr. 11	May 2	Apr. 30	Apr. 29	Mar. 31	Apr. 2	Apr. 12	May 22	Apr. 22	Apr. 20
Grand Haven, Mich.....	43	5	Apr. 15	Apr. 17	Apr. 11	May 2	Apr. 30	Apr. 5	Mar. 30	Apr. 3	Apr. 13	Apr. 13	Apr. 22	Apr. 16
Rochester, N. Y.....	43	8	Apr. 21	Apr. 17	May 2	May 2	Apr. 30	Apr. 1	Mar. 26	Apr. 11	Apr. 13	Apr. 11	Apr. 28	May 16
Oswego, N. Y.....	43	29	Apr. 28	Apr. 20	May 2	May 2	Apr. 30	Apr. 12	Mar. 13	May 2	Apr. 13	Apr. 13	Apr. 28	May 16
Portland, Me.....	43	39	Apr. 18	Apr. 18	Apr. 30	Apr. 14	Apr. 19	Apr. 12	Apr. 1	Apr. 19	Apr. 17	May 15	Apr. 8	May 10
La Crosse, Wis.....	43	49	Apr. 4	Apr. 13	Apr. 30	May 1	Apr. 3	Apr. 29	May 4	Apr. 2	Apr. 16	Mar. 21	Apr. 21	Apr. 15
Mount Washington, N. H.....	44	16	.....	.....	Apr. 20	May 1	Apr. 3	Apr. 29	May 4	Apr. 2	Apr. 12	May 21	Apr. 21	Apr. 15
Huron, Dak.....	44	21	.....	.....	.....	May 1	Apr. 3	Apr. 29	May 4	Apr. 2	Apr. 12	May 21	May 21	May 30
Deadwood, Dak.....	44	23	.....	.....	.....	May 1	Apr. 3	Apr. 29	May 4	Apr. 2	Apr. 12	May 21	May 21	May 30
Fort Bennett, Dak.....	44	39	.....	.....	Apr. 30	Apr. 21	May 13	Apr. 12	Apr. 7	May 2	May 17	May 23	May 23	Apr. 8
Eastport, Me.....	44	54	May 3	May 3	Apr. 30	Apr. 21	May 13	Apr. 12	Apr. 7	Apr. 19	Apr. 16	May 23	May 23	May 12
Saint Paul, Minn.....	44	54	May 1	May 1	Apr. 14	Apr. 21	May 3	Apr. 9	Mar. 31	Apr. 2	Apr. 16	May 15	May 15	Apr. 13
Albena, Mich.....	45	5	.....	.....	.....	Apr. 21	May 3	Apr. 18	June 8	June 7	June 11	May 23	May 23	Apr. 9
Fort Custer, Mont.....	45	43	.....	.....	.....	Apr. 21	May 3	Apr. 18	June 8	June 7	June 11	May 23	May 23	May 15
Mackinaw City, Mich.....	45	47	Apr. 24	Apr. 24	Apr. 20	May 5	May 3	May 3	May 12	Apr. 3	Apr. 16	Apr. 26	Apr. 26	Apr. 30
Escanaba, Mich.....	45	48	.....	.....	.....	May 5	May 3	May 3	May 12	Apr. 3	Apr. 16	Apr. 26	Apr. 26	Apr. 30
Helena, Mont.....	46	34	Apr. 21	May 12	Apr. 22	May 4	May 4	Apr. 30	May 11	May 5	Apr. 29	May 19	May 19	Apr. 27
Marquette, Mich.....	46	47	.....	.....	.....	May 4	May 4	Apr. 30	May 11	May 5	Apr. 29	May 19	May 19	Apr. 27
Bismarck, Dak.....	46	47	Apr. 9	Apr. 9	Apr. 21	May 1	May 1	Apr. 30	Mar. 26	Apr. 2	Apr. 23	May 23	May 23	Apr. 28
Duluth, Minn.....	46	48	May 10	Apr. 21	Apr. 21	May 1	May 1	Apr. 30	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Mouthad, Minn.....	46	62	May 1	Apr. 24	Apr. 6	Apr. 30	June 3	Apr. 4	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Fort Shaw, Mont.....	47	31	.....	.....	.....	Apr. 30	June 3	Apr. 4	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Fort Benton, Mont.....	47	50	.....	.....	.....	Apr. 30	June 3	Apr. 4	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Fort Buford, Dak.....	48	0	.....	.....	.....	Apr. 30	June 3	Apr. 4	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Poplar River, Mont.....	48	8	.....	.....	.....	Apr. 30	June 3	Apr. 4	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Fort Assinaboine, Mont.....	48	10	.....	.....	.....	Apr. 30	June 3	Apr. 4	May 10	Apr. 2	Apr. 23	May 23	May 23	Apr. 27
Saint Vincent, Minn.....	48	32	May 8	Apr. 27	Apr. 27	May 4	Apr. 30	June 8	May 10	May 5	Apr. 16	May 19	Apr. 4	Apr. 30
.....	48	56	.....	.....	.....	May 4	Apr. 30	June 8	May 10	May 5	Apr. 16	May 19	Apr. 4	Apr. 30

No reliable record.

Snow every month in the year.

Station temporarily closed.

## APPENDIX 72.

*Table showing the quadrants from which the winds most likely to be followed by rain or each month*

[Computed from observations taken during a period of

Stations.	January.	February.	March.	April.	May.
<b>NEW ENGLAND.</b>					
Eastport, Me. ....	E. to S.	SE. to SW.	E. to S.	N. to E.	N. to W.
Portland, Me. ....	NW. to NE.	S. to W.	E. to S.	SE. to SW.	SE. to SW.
Burlington, Vt. <sup>1</sup> ..	E. to S.	S. to W.	SE. to SW.	S. to W.	S. to W.
Boston, Mass. ....	SW. to NW.	SE. to W.	NE. to SE.	E. to S.	NE. to W.
Provincetown, Mass. ....	SE. to SW.	S. to W.	SE. to SW.	SE. to SW.	SE. to SW.
Springfield, Mass. <sup>2</sup> ..	NW. to NE.	NW. to NE.	NW. to NE.	SE. to SW.	N. to W.
Thatcher's Island, Mass. <sup>3</sup> ..	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Wood's Holl, Mass. <sup>4</sup> ..	SE. to SW.	SE. to SW.	E. to S.	NE. to SE.	SE. to SW.
Block Island, R. I. ....	NE. to SE.	SE. to SW.	E. to S.	E. to S.	S. to W.
Newport, R. I. <sup>5</sup> ....	S. to W.	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.
New Haven, Conn. ....	NW. to NE.	NW. to NE.	E. to S.	SE. to SW.	SE. to SW.
New London, Conn. ....	N. to E.	SE. to SW.	SE. to SW.	SE. to SW.	NE. to SW.
<b>MIDDLE ATLANTIC STATES.</b>					
Albany, N. Y. ....	SE. to SW.	S. to W.	S. to W.	W. to N.	S. to W.
New York City. ....	NE. to SE.	NE. to SE.	NE. to SE.	E. to S.	SE. to SW.
Philadelphia, Pa. ....	N. to E.	NE. to SE.	E. to S.	SE. to SW.	SE. to SW.
Williamsport, Pa. <sup>1</sup> ..	NE. to SE.	E. to S.	E. to S.	S. to W.	E. to S.
Atlantic City, N. J. ....	N. to E.	E. to S.	E. to S.	E. to S.	NE. to SE.
Barneget City, N. J. ....	S. to W.	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.
Cape May, N. J. ....	N. to E.	E. to S.	E. to S.	E. to S.	E. to S.
Sandy Hook, N. J. ....	N. to E.	SE. to SW.	E. to S.	E. to S.	SE. to SW.
Delaware Breakwater, Del. ....	NW. to NE.	SE. to SW.	NE. to SE.	NE. to SE.	SE. to SW.
Baltimore, Md. ....	NE. to SE.	NE. to SE.	NE. to SE.	E. to S.	SE. to SW.
Washington City. ....	NE. to SE.	E. to S.	E. to S.	E. to S.	SE. to SW.
Cape Henry, Va. ....	N. to E.	SE. to SW.	E. to S.	E. to S.	SE. to SW.
Chincoteague, Va. ....	N. to E.	E. to S.	E. to S.	E. to S.	SE. to SW.
Lynchburg, Va. ....	N. to E.	S. to W.	E. to S.	S. to W.	S. to W.
Norfolk, Va. ....	N. to E.	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.
<b>SOUTH ATLANTIC STATES.</b>					
Cape Lookout, N. C. <sup>6</sup> ..	SE. to SW.	SW. to NW.	NE. to SE.	S. to W.	NE. to SE.
Charlotte, N. C. ....	NE. to SE.	E. to S.	SE. to SW.	SE. to SW.	SE. to SW.
Hatteras, N. C. ....	NW. to NE.	NW. to NE.	SE. to SW.	SE. to SW.	SE. to SW.
Kitty Hawk, N. C. ....	N. to E.	SE. to SW.	SE. to SW.	SE. to SW.	NE. to SE.
Macon, Fort, N. C. ....	NW. to NE.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Portsmouth, N. C. ....	N. to E.	SE. to SW.	SE. to SW.	S. to W.	E. to S.
Smithville, N. C. ....	N. to E.	N. to E.	SE. to SW.	S. to W.	SE. to SW.
Wilmington, N. C. ....	N. to E.	NE. to SE.	SE. to SW.	S. to W.	SE. to SW.
Charleston, S. C. ....	NW. to NE.	N. to E.	S. to W.	SE. to SW.	SE. to SW.
Augusta, Ga. ....	NE. to SE.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Savannah, Ga. ....	SE. to SW.	NE. to SE.	SE. to SW.	SE. to SW.	N. to E.
Jacksonville, Fla. ....	NW. to NE.	E. to S.	SE. to SW.	SE. to SW.	NE. to SE.
<b>FLORIDA PENINSULA.</b>					
Cedar Keys, Fla. ....	S. to W.	E. to S.	E. to S.	S. to W.	E. to S.
Key West, Fla. ....	NE. to SE.	NE. to SE.	N. to E.	NE. to SE.	NE. to SE.
Punta Rasa, Fla. <sup>1</sup> ..	NE. to SE.	E. to S.	SE. to SW.	S. to W.	S. to W.
Sanford, Fla. ....			(?)	Variable.	S. to W.
<b>EASTERN GULF STATES.</b>					
Atlanta, Ga. ....	NE. to SE.	E. to S.	S. to W.	SE. to SW.	E. to S.
Pensacola, Fla. ....	NE. to SE.	E. to S.	SE. to SW.	SE. to SW.	E. to S.
Mobile, Ala. ....	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.	SE. to SW.
Montgomery, Ala. ....	E. to S.	E. to S.	SE. to SW.	SE. to SW.	E. to S.
Starkville, Miss. <sup>1</sup> ..	SE. to SW.	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.
Vicksburg, Miss. ....	SE. to SW.	E. to S.	E. to S.	E. to S.	SE. to SW.
New Orleans, La. ....	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.

<sup>1</sup> Station closed June 15, 1893.

<sup>2</sup> Station closed December 31, 1892.

<sup>3</sup> Changed to third class station, May 31, 1893.

<sup>4</sup> Station closed January 31, 1892.

## APPENDIX 72.

snow are observed to blow at stations of the Signal Service, United States Army, during of the year.

from one to thirteen years—1871 to 1883 inclusive.]

June.	July.	August.	September.	October.	November.	December.
S. to W. SE. to SW. S. to W. S. to W. NE. to SW. S. to W. S. to W. NE. to SW. SE. to SW. SE. to SW. SE. to SW.	S. to W. SE. to SW. SE. to SW. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. SE. to SW. SE. to SW. SE. to SW. Variable. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. SE. to SW. S. to W. SE. to SW. NE. to SE. SE. to SW. E. to S. NE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. SE. to SW. S. to W. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. NE. to SE.	SE. to SW. SE. to SW. E. to S. E. to S. SE. to SW. SE. to SW. NE. to SE. SE. to SW. S. to W. SE. to SW. NE. to SE. SE. to SW.	SE. to SW. W. to N. E. to S. SE. to SW. SE. to SW. NW. to NE. Variable. NE. to SE. NE. to SE. N. to E. NW. to NE.
S. to W. NE. to SW. S. to W. NW. to NW. S. to W. S. to W. NE. to SW. NE. to SW. NE. to SW. SE. to SW. SE. to SW.	S. to W. SE. to SW. S. to W. Variable. SE. to SW. SE. to SW. E. to S. SE. to SW. SE. to SW. S. to W. SE. to SW.	S. to W. SE. to SW. S. to W. NE. to SE. SE. to SW. SE. to SW. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. E. to S. S. to W. Variable. E. to S. E. to S. NE. to SE. E. to S. NE. to SE. NE. to SE. E. to S.	SE. to SW. NE. to SE. SE. to SW. E. to S. SE. to SW. E. to S. NE. to SE. NE. to SE. E. to S. SE. to SW. SE. to SW.	S. to W. NE. to SE. S. to W. NE. to SE. SE. to SW. SE. to SW. E. to S. NW. to NE. E. to S. N. to E. N. to E.	SE. to SW. NE. to SE. SE. to SW. E. to S. SE. to SW. E. to S. N. to E. SE. to SW. SE. to SW. S. to W. SE. to SW.
SE. to SW. S. to W. SE. to SW. S. to W. SE. to SW. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. SE. to SW. SE. to SW. S. to W. SE. to SW. SE. to SW. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	NE. to SE. NE. to SE. NE. to SE. NE. to SE. NW. to NE. NE. to SE. NE. to SE. NE. to SE. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. NE. to SE. N. to E. NE. to SE. NW. to NE. N. to E. NE. to SE. N. to E. N. to E. N. to E.	NE. to SE. NE. to SE. NE. to SE. N. to E. NE. to SE. NE. to SE. N. to E. NE. to SE. N. to E. N. to E. N. to E.	Variable. SE. to SW. S. to W. N. to E. Variable. SE. to SW. N. to E. N. to E. N. to E. S. to W. SE. to SW.
S. to W. NE. to SE. E. to S. SE. to SW.	S. to W. NE. to SE. SE. to SW. SE. to SW.	S. to W. NE. to SE. NE. to SE. NE. to SE.	SE. to SW. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. NE. to SE. NW. to NE.	NE. to SE. NE. to SE. E. to S. NW. to NE.	E. to S. NE. to SE. SE. to SW. N. to E.
S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	S. to W. SE. to SW. SE. to SW. S. to W. SE. to SW.	S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. NE. to SE. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. N. to E. NE. to SE. N. to E.	E. to S. NE. to SE. SE. to SW. N. to E.
S. to W. NE. to SE. E. to S. SE. to SW.	S. to W. NE. to SE. SE. to SW. SE. to SW.	S. to W. NE. to SE. NE. to SE. NE. to SE.	SE. to SW. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. N. to E. NE. to SE.	E. to S. NE. to SE. SE. to SW. N. to E.

\* Station closed March 31, 1883.

\* Station closed December 31, 1880.

\* Made a first-class station March 26, 1883.

Table showing the quadrants from which the winds most likely to be followed by rain

Stations.	January.	February.	March.	April.	May.
<b>WESTERN GULF STATES.</b>					
Port Eads, La. <sup>1</sup>	E. to S.	E. to S.	E. to S.	E. to S.	SE. to SW.
Shreveport, La.	E. to S.	E. to S.	E. to S.	E. to S.	SE. to SW.
Fort Smith, Ark.	N. to E.	NE. to SE.	Variable.	E. to S.	E. to S.
Little Rock, Ark.	E. to S.	E. to S.	SE. to SW.	E. to S.	E. to S.
Fort Gibson, Ind. T. <sup>2</sup>	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Boerne, Tex. <sup>3</sup>	E. to S.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
Corsicana, Tex. <sup>4</sup>	E. to S.	SE. to SW.	SE. to SW.	E. to S.	E. to S.
Decatur, Tex. <sup>5</sup>	NW. to NE.	E. to S.	E. to S.	SE. to SW.	NE. to SE.
Denison, Tex. <sup>6</sup>	NE. to SE.	SE. to SW.	SE. to SW.	E. to S.	E. to S.
Fredericksburg, Tex. <sup>7</sup>	N. to E.	S. to W.	E. to S.	S. to W.	SE. to SW.
Galveston, Tex.	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Indianola, Tex.	N. to E.	NE. to SE.	E. to S.	E. to S.	E. to S.
Mason, Tex. <sup>8</sup>	N. to E.	SE. to SW.	E. to S.	NE. to SE.	E. to S.
Palentine, Tex.	E. to S.	E. to S.	E. to S.	E. to S.	SE. to SW.
Pilot Point, Tex. <sup>9</sup>	NW. to NE.	NW. to NE.	NE. to SE.	E. to S.	E. to S.
San Antonio, Tex. <sup>10</sup>	N. to E.	N. to E.	NE. to SE.	NE. to SE.	E. to S.
<b>RIO GRANDE VALLEY.</b>					
Brackettville, Tex. <sup>11</sup>	NE. to SE.	NE. to SE.	N. to E.	N. to E.	E. to S.
Brownsville, Tex.	NW. to NE.	N. to E.	N. to E.	NE. to SE.	NE. to SE.
Castroville, Tex. <sup>12</sup>	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Eagle Pass, Tex. <sup>13</sup>	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
Edinburg, Tex. <sup>14</sup>	NW. to NE.	SE. to SW.	NE. to SE.	NE. to SE.	Variable.
Laredo, Tex. <sup>15</sup>	N. to E.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
Rio Grande City, Tex.	NE. to SE.	NW. to NE.	NE. to SE.	NE. to SE.	NE. to SE.
Uvalde, Tex.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.	E. to S.
<b>OHIO VALLEY AND TENNESSEE.</b>					
Chattanooga, Tenn.	NE. to SE.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Knoxville, Tenn.	N. to E.	S. to W.	S. to W.	SW. to NW.	SW. to NW.
Memphis, Tenn.	SE. to SW.	E. to S.	NE. to SE.	SE. to SW.	SE. to SW.
Nashville, Tenn.	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Louisville, Ky.	E. to S.	E. to S.	SE. to SW.	SE. to SW.	SE. to SW.
Indianapolis, Ind.	SE. to SW.	E. to S.	E. to S.	SE. to SW.	SE. to SW.
Cincinnati, Ohio.	SE. to SW.	E. to S.	E. to S.	SE. to SW.	SE. to SW.
Columbus, Ohio.	E. to S.	SE. to SW.	SE. to SW.	S. to W.	S. to W.
Morgantown, W. Va. <sup>1</sup>	S. to W.	S. to W.	S. to W.	S. to W.	SE. to SW.
Pittsburg, Pa.	S. to W.	S. to W.	NE. to SE.	SW. to NW.	S. to W.
<b>LOWER LAKES.</b>					
Buffalo, N. Y.	S. to W.	S. to W.	SE. to SW.	S. to W.	SE. to SW.
Oswego, N. Y.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Rochester, N. Y.	S. to W.	S. to W.	SE. to SW.	S. to W.	SE. to SW.
Erie, Pa.	S. to W.	SE. to SW.	S. to W.	S. to W.	S. to W.
Cleveland, Ohio.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Sandusky, Ohio.	S. to W.	SE. to SW.	SE. to SW.	S. to W.	S. to W.
Toledo, Ohio.	S. to W.	S. to W.	S. to W.	S. to W.	S. to W.
Detroit, Mich.	S. to W.	S. to W.	E. to S.	S. to W.	S. to W.
<b>UPPER LAKES.</b>					
Alpena, Mich.	SE. to SW.	SE. to SW.	SE. to SW.	NE. to SE.	E. to S.
Escanaba, Mich.	W. to N.	E. to S.	NE. to SE.	E. to S.	E. to S.
Grand Haven, Mich.	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Mackinaw City, Mich.	SE. to SW.	SE. to SW.	SW. to NW.	NE. to SE.	E. to S.
Marquette, Mich.	SW. to NW.	W. to N.	SW. to NW.	NW. to NE.	E. to S.
Port Huron, Mich.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Champaign, Ill. <sup>1</sup>	E. to S.	E. to S.	NE. to SE.	SE. to SW.	SE. to SW.
Chicago, Ill.	S. to W.	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.
Milwaukee, Wis.	SE. to SW.	SE. to SW.	NE. to SE.	NE. to SE.	NE. to SE.
Duluth, Minn.	SW. to NW.	NW. to NE.	NW. to NE.	NW. to NE.	NW. to NE.
<b>UPPER MISSISSIPPI VALLEY.</b>					
Saint Paul, Minn.	E. to S.	NE. to SE.	E. to S.	E. to S.	E. to S.
La Crosse, Wis.	SE. to SW.	E. to S.	E. to S.	E. to S.	E. to S.
Madison, Wis. <sup>1</sup>	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Davenport, Iowa.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.	E. to S.
Des Moines, Iowa.	SE. to SW.	NE. to SE.	NE. to SE.	NE. to SE.	SE. to SW.
Dubuque, Iowa.	E. to S.	E. to S.	E. to S.	NE. to SE.	SE. to SW.
Keokuk, Iowa.	SE. to SW.	NE. to SE.	E. to S.	E. to S.	E. to S.
Calro, Ill.	E. to S.	E. to S.	SE. to SW.	E. to S.	SE. to SW.
Springfield, Ill.	E. to S.	SE. to SW.	NE. to SE.	E. to S.	SE. to SW.
Saint Louis, Mo.	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.

<sup>1</sup> Station closed March 31, 1883.<sup>2</sup> Station closed May 13, 1882.<sup>3</sup> Station closed July 28, 1880.<sup>4</sup> Station closed October 31, 1881.<sup>5</sup> Station closed March 31, 1881.<sup>6</sup> Station closed March 25, 1882.

or snow are observed to blow at stations of the Signal Service, &c.—Continued.

June.	July.	August.	September.	October.	November.	December.
E. to S. SE. to SW. S. to W. S. to W. E. to S. E. to S. SE. to SW. SE. to SW. E. to S. E. to S. NE. to SE. E. to S. SE. to SW. NE. to SE.	SE. to SW. E. to S. S. to W. SE. to SW. E. to S. NE. to SE. SE. to SW. SE. to SW. E. to S. E. to S. SE. to SW. E. to S. SE. to SW. NE. to SE.	SE. to SW. NE. to SE. NE. to SE. NE. to SE. E. to S. NE. to SE. SE. to SW. SE. to SW. E. to S. E. to S. NE. to SE. S. to W. SE. to SW. NE. to SE.	E. to S. E. to S. N. to E. SE. to SW. E. to S. NE. to SE. E. to S. E. to S. N. to E. E. to S. NE. to SE. E. to S. E. to S. NE. to SE.	E. to S. SE. to SW. E. to S. SE. to SW. E. to S. NE. to SE. E. to S. NE. to SE. E. to S. E. to S. NE. to SE. E. to S. E. to S. NE. to SE.	E. to S. E. to S. E. to S. E. to S. E. to S. E. to S. N. to E. NE. to SE. E. to S. E. to S. N. to E. NW. to NE. E. to S. E. to S. N. to E.	E. to S. E. to S. E. to S. NE. to SE. E. to S. E. to S. NE. to SE. E. to S. E. to S. E. to S. NE. to SE. NE. to SE. NE. to SE. NE. to SE.
NE. to SE. NE. to SE. E. to S. E. to S. NE. to SE. E. to S. E. to S.	E. to S. E. to S. E. to S. Variable. NE. to SE. NE. to SE. E. to S.	NE. to SE. NE. to SE. NE. to SE. NE. to SE. NE. to SE. NE. to SE. E. to S.	E. to S. N. to E. E. to S. E. to S. Variable. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. NE. to SE. E. to S. NE. to SE. E. to S. NE. to SE. NE. to SE. NE. to SE.	N. to E. N. to E. NE. to SE. NE. to SE. NW. to NE. NW. to NE. NW. to NE. NW. to NE.	N. to E. N. to E. NE. to SE. NE. to SE. NE. to SE. NW. to NE. NW. to NE. NE. to SE.
S. to W. S. to W. SE. to SW. S. to W. SE. to SW. SE. to SW. SE. to SW. S. to W. SE. to SW. S. to W.	S. to W. SW. to NW. SW. to NW. S. to W. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W. S. to W.	SE. to SW. S. to W. W. to N. SW. to NW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. S. to W.	SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. SW. to NW. E. to S. SE. to SW. E. to S. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W.	SE. to SW. SE. to SW. E. to S. E. to S. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. S. to W. NE. to SE. E. to S. E. to S. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W.
SE. to SW. S. to W. S. to W. S. to W. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W. SE. to SW.	SE. to SW. SE. to SW. S. to W. S. to W. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W. S. to W.	S. to W. SE. to SW. SW. to NW. S. to W. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W. SE. to SW.	S. to W. SE. to SW. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W. SE. to SW.	S. to W. SE. to SW. S. to W. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	S. to W. SE. to SW. S. to W. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	S. to W. SE. to SW. S. to W. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. S. to W.
E. to S. NE. to SW. SE. to SW. W. to N. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. NW. to NE.	SE. to SW. SE. to SW. SE. to SW. S. to W. S. to W. S. to W. SE. to SW. SE. to SW. SE. to SW. NW. to NE.	SE. to SW. SE. to SW. E. to S. W. to N. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. NW. to NE.	SE. to SW. SE. to SW. E. to S. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. NW. to NE.	S. to W. SE. to SW. E. to S. SE. to SW. S. to W. SE. to SW. SE. to SW. SE. to SW. SE. to SW. NE. to SE.	SW. to NW. S. to W. E. to S. SE. to SW. SW. to NW. S. to W. E. to S. SE. to SW. SE. to SW. SW. to NW.	S. to W. W. to N. E. to S. SW. to NW. SW. to NW. S. to W. SE. to SW. S. to W. SW. to NW. SW. to NW.
E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. SE. to SW. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. E. to S. E. to S. SE. to SW. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW.	E. to S. E. to S. E. to S. SE. to SW. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. E. to S.

\* Station closed April 15, 1882.

\* Station closed June 15, 1883.

\* Reduced to third-class station Dec. 16, 1882.

\* Station closed March 29, 1882.

\* Reduced to third-class station Feb. 12, 1882.



Table showing the quadrants from which the winds most likely to be followed by rain

Stations.	January.	February.	March.	April.	May.
<b>MISSOURI VALLEY.</b>					
Springfield, Mo. <sup>1</sup>	NE. to SE.	E. to S.	NE. to SE.	SE. to SW.	SE. to SW.
Leavenworth, Kans.	NW. to NE.	NW. to NE.	E. to S.	E. to S.	E. to S.
Omaha, Nebr.	N. to E.	NW. to NE.	E. to S.	NE. to SE.	E. to S.
Bennett, Fort, Dak.	NW. to NE.	NW. to NE.	NE. to SE.	NE. to SE.	NE. to SE.
Huron, Dak.	W. to N.	NW. to NE.	Variable.	NE. to SE.	NE. to SE.
Yankton, Dak.	NW. to NE.	NW. to NE.	E. to S.	NE. to SE.	E. to S.
<b>EXTREME NORTHWEST.</b>					
Breckenridge, Minn. <sup>2</sup>	NW. to NE.	NE. to SE.	NE. to SE.	NE. to SE.	SE. to SW.
Moorhead, Minn.	SE. to SW.	NE. to SE.	NE. to SE.	E. to S.	SE. to SW.
Saint Vincent, Minn.	SE. to SW.	E. to S.	E. to S.	NE. to SE.	E. to S.
Bismarck, Dak.	NW. to NE.	N. to E.	N. to E.	NE. to SE.	E. to S.
Buford, Fort, Dak.	SW. to NW.	NE. to SE.	NE. to SE.	NE. to SE.	E. to S.
Stevenson, Fort, Dak. <sup>1</sup>	N. to E.	SW. to NW.	NE. to SE.	E. to S.	NE. to SE.
<b>NORTHERN SLOPE.</b>					
Assinaboine, Fort, Mont.	SW. to NW.	NW. to NE.	SW. to NW.	NW. to NE.	{ N. to E. S. to W. }
Benton, Fort, Mont.	SW. to NW.	SW. to NW.	NW. to NE.	N. to E.	NE. to SE.
Billings, Mont. <sup>2</sup>	N. to E.	SW. to NW.	NW. to NE.	N. to E.	E. to S.
Custer, Fort, Mont.	SE. to SW.	W. to N.	W. to N.	NW. to NE.	NW. to NE.
Helena, Mont.	SW. to NW.	SW. to NW.	SW. to NW.	S. to W.	S. to W.
Keogh, Fort, Mont. <sup>1</sup>	SW. to NW.	NW. to NE.	SW. to NW.	NW. to NE.	NE. to SE.
Maginnis, Fort, Mont.	W. to N.	SW. to NW.	SW. to NW.	Variable.	NE. to SE.
Poplar River, Mont.	NW. to NE.	NW. to NE.	SW. to NW.	NE. to SE.	NW. to NE.
Shaw, Fort, Mont.	SW. to NW.	SW. to NW.	W. to N.	W. to N.	E. to S.
Virginia City, Mont. <sup>4</sup>	SE. to SW.	SW. to NW.	SW. to NW.	S. to W.	SW. to NW.
Deadwood, Dak.	NW. to NE.	N. to E.	Variable.	NW. to NE.	NW. to NE.
Cheyenne, Wyo.	W. to N.	W. to N.	NW. to NE.	NW. to NE.	NW. to NE.
Washakie, Fort, Wyo. <sup>1</sup>	SW. to NW.	N. to E.	NE. to SE.	Variable.	NW. to NE.
North Platte, Nebr.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
<b>MIDDLE SLOPE.</b>					
Denver, Colo.	NW. to NE.	NW. to NE.	N. to E.	NW. to NE.	NW. to NE.
West Las Animas, Colo.	N. to E.	NE. to SE.	Variable.	E. to S.	N. to E.
Dodge City, Kans.	NW. to NE.	NE. to SE.	NE. to SE.	N. to E.	E. to S.
Elliot, Fort, Tex.	SE. to SW.	NW. to NE.	NW. to NE.	NE. to SE.	NE. to SE.
<b>SOUTHERN SLOPE.</b>					
Sill, Fort, Ind. T.	NE. to SE.	Variable.	NW. to NE.	E. to S.	E. to S.
Coleman City, Tex. <sup>2</sup>	NW. to NE.	E. to S.	SE. to SW.	NE. to SE.	E. to S.
Concho, Fort, Tex.	NW. to NE.	N. to E.	E. to S.	SE. to SW.	E. to S.
Davis, Fort, Tex.	NW. to NE.	SW. to NW.	N. to E.	NW. to NE.	E. to S.
Griffin, Fort, Tex. <sup>4</sup>	N. to E.	NE. to SE.	N. to E.	NE. to SE.	E. to S.
Henrietta, Tex. <sup>7</sup>	N. to E.	E. to S.	E. to S.	E. to S.	E. to S.
Jackaboro, Tex. <sup>1</sup>	NW. to NE.	E. to S.	E. to S.	SE. to SW.	E. to S.
McKavett, Fort, Tex. <sup>2</sup>	W. to N.	SE. to SW.	E. to S.	E. to S.	NE. to SE.
Stockton, Fort, Tex.	NE. to SE.	SE. to SW.	NE. to SE.	NE. to SE.	E. to S.
<b>SOUTHERN PLATEAU.</b>					
La Mesilla, N. Mex. <sup>3</sup>	Variable.	NE. to SE.	SW. to NW.	SE. to SW.	Variable.
Santa Fé, N. Mex. <sup>1</sup>	NE. to SE.	S. to W.	SE. to SW.	SW. to NW.	SE. to SW.
Silver City, N. Mex. <sup>7</sup>	S. to W.	SW. to NW.	SW. to NW.	S. to W.	SW. to NW.
Socorro, N. Mex. <sup>10</sup>	S. to W.	NW. to NE.	S. to W.	SE. to SW.	NE. to SE.
El Paso, Tex.	NE. to SE.	W. to N.	SW. to NW.	SW. to NW.	NE. to SE.
Apache, Fort, Ariz.	S. to W.	S. to W.	SE. to SW.	SW. to NW.	SE. to SW.
Burke's, Ariz. <sup>11</sup>	S. to W.	S. to W.	SE. to SW.	S. to W.	SE. to SW.
Florence, Ariz. <sup>12</sup>	S. to W.	NE. to SE.	E. to S.	SW. to NW.	SW. to NW.
Grant, Fort, Ariz.	NW. to NE.	N. to E.	S. to W.	SW. to NW.	Variable.
Phoenix, Ariz. <sup>13</sup>	SE. to SW.	E. to S.	S. to W.	S. to W.	Variable.
Prescott, Ariz.	SE. to SW.	SE. to SW.	E. to S.	SE. to SW.	E. to S.
Thomas, Fort, Ariz.	W. to N.	SW. to NW.	E. to S.	W. to N.	Variable.
Tucson, Ariz. <sup>1</sup>	SE. to SW.	S. to W.	E. to S.	S. to W.	Variable.
Verdi, Fort, Ariz. <sup>14</sup>	S. to W.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Wickenburg, Ariz. <sup>12</sup>	SE. to SW.	SE. to SW.	SE. to SW.	E. to S.	S. to W.
Yuma, Ariz.	SE. to SW.	NE. to SE.	S. to W.	SW. to NW.	No precipitation.

<sup>1</sup> Station closed June 15, 1883.<sup>2</sup> Station closed November 30, 1880.<sup>3</sup> Station closed June 24, 1883.<sup>4</sup> Station closed November 18, 1880.<sup>5</sup> Station closed August 1, 1883.<sup>6</sup> Station closed April 14, 1883.<sup>7</sup> Station closed March 31, 1883.<sup>8</sup> Station closed February, 1883.

or snow are observed to blow at stations of the Signal Service, &c.—Continued.

June.	July.	August.	September.	October.	November.	December.
SE. to SW. SE. to SW. E. to S. NE. to SE. NE. to SE. E. to S.	SE. to SW. SE. to SW. SE. to SW. NE. to SE. NE. to SE. E. to S.	W. to N. NW. to NE. SE. to SW. NE. to SE. NE. to SE. E. to S.	SE. to SW. SE. to SW. E. to S. NE. to SE. NW. to NE. E. to S.	SE. to SW. E. to S. E. to S. NE. to SE. NE. to SE. E. to S.	SE. to SW. E. to S. NW. to NE. W. to N. NW. to NE. W. to N.	SE. to SW. E. to S. NW. to NE. NE. to SE. NE. to SE. NW. to NE.
SE. to SW. SE. to SW. E. to S. E. to S. NE. to SE. NE. to SE.	E. to S. Variable. SE. to SW. E. to S. NE. to SE. NE. to SE.	E. to S. SE. to SW. E. to S. E. to S. NE. to SE. E. to S.	E. to S. NW. to NE. SE. to SW. NW. to NE. SW. to NW. NE. to SE.	E. to S. E. to S. {E. to S. {NW. to NE. NE. to SE. N. to E. W. to N.	E. to S. NW. to NE. SE. to SW. NW. to NE. SW. to NW. SW. to NW.	SE. to SW. NW. to NE. SE. to SW. NE. to SE. N. to E. W. to N.
SW. to NW. N. to E. NE. to SE. SW. to NW. S. to W. NW. to NE. NW. to NE. NE. to SE. NW. to NW. SW. to NW. N. to E. E. to S. NW. to NE. E. to S.	SW. to NW. SW. to NW. ( <sup>2</sup> ) W. to N. S. to W. NW. to NE. SE. to SW. NW. to NE. S. to W. SE. to SW. E. to S. Variable. NE. to SE.	NE. to SE. NW. to NE. ( <sup>2</sup> ) NE. to SE. S. to W. NE. to SE. SW. to NW. N. to E. N. to E. W. to N. NE. to SE. E. to S. NE. to SE. E. to S.	S. to W. SW. to NW. ( <sup>2</sup> ) N. to E. SW. to NW. W. to N. NW. to NE. NE. to SE. SW. to NW. W. to N. NW. to NE. Variable. NE. to SE.	Variable. SW. to NW. ( <sup>2</sup> ) NW. to NE. SE. to SW. W. to N. SW. to NW. SE. to SW. SW. to NW. SW. to NW. NW. to NE. NW. to NE. W. to N. SW. to NW. NE. to SE.	SW. to NW. SW. to NW. ( <sup>2</sup> ) NW. to NE. SW. to NW. W. to N. NW. to NE. NW. to NE. W. to N. SW. to NW. S. to W. W. to N. SE. to SW. NW. to NE.	Variable. NW. to NE. ( <sup>2</sup> ) NW. to NE. NW. to NE. NW. to NE. NE. to SE. S. to W. NW. to NE. S. to W. NW. to NE.
NW. to NE. E. to S. SE. to SW. SE. to SW.	NW. to NE. E. to S. E. to S. NE. to SE.	NW. to NE. NE. to SE. E. to S. E. to S.	NW. to NE. NE. to SE. E. to S. SE. to SW.	N. to E. NE. to SE. N. to E. NE. to SE.	NW. to NE. Variable. NW. to NE. NE. to SE.	NW. to NE. NE. to SE. N. to E. NE. to SE.
E. to S. E. to S. E. to S. SE. to SW. NE. to SE. E. to S. E. to S. E. to S. E. to S.	E. to S. SE. to SW. E. to S. N. to E. NE. to SE. NE. to SE. E. to S. NE. to SE. E. to S.	NW. to NE. NE. to SE. E. to S. NE. to SE. NW. to NE. SE. to SW. E. to S. SE. to SW. NE. to SE.	SE. to SW. NE. to SE. NE. to SE. NW. to NE. NE. to SE. E. to S. E. to S. NE. to SE.	SE. to SW. E. to S. NE. to SE. NE. to SE. NE. to SE. E. to S. NE. to SE. E. to S. SE. to SW.	N. to E. N. to E. N. to E. NW. to NE. N. to E. NE. to SE. NE. to SE. N. to E. N. to E.	NW. to NE. N. to E. N. to E. N. to E. N. to E. N. to E. NE. to SE. NW. to NE.
SE. to SW. E. to S. W. to N. Variable. NE. to SE. NE. to SE. No precipi- tation. No precipi- tation. E. to S. Variable. SE. to SW. SE. to SW. SW. to NW. SE. to SW. NE. to SE. S. to W.	SE. to SW. SE. to SW. E. to S. SE. to SW. SE. to SW. SE. to SW. SE. to SW. SE. to SW. S. to W. SE. to SW.	E. to S. N. to E. SE. to SW. SE. to SW. NE. to SE. SW. to NW. E. to S.	W. to N. SE. to SW. S. to W. Variable. N. to E. SW. to NW. Variable. SW. to NW. Variable.	SE. to SW. E. to S. SE. to SW. SE. to SW. S. to W. SE. to SW. Variable. S. to W. E. to S.	NE. to SE. E. to S. SE. to SW. E. to S. NE. to SE. NE. to SE. NE. to SE. S. to W. W. to N.	E. to S. SE. to SW. SW. to NW. W. to N. SW. to NW. SW. to NW. SE. to SW. S. to W. W. to N.

<sup>8</sup> Station closed August 6, 1882.

<sup>9</sup> Closed May 23, 1881.

<sup>10</sup> Closed December, 1880.

<sup>11</sup> Closed April 30, 1882.

<sup>12</sup> Changed to a third-class station Dec. 31, 1881.

<sup>13</sup> Changed to a third-class station Oct. 10, 1883.

*Table showing the quadrants from which the winds most likely to be followed by rain*

Stations.	January.	February.	March.	April.	May.
<b>MIDDLE PLATEAU.</b>					
Pioche, Nev. <sup>1</sup> .....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	S. to W.
Winnemucca, Nev. <sup>1</sup> .....	S. to W.	SE. to SW.	S. to W.	SW. to NW.	S. to W.
Salt Lake City, Utah.....	E. to S.	E. to S.	E. to S.	NE. to SE.	SW. to NW.
<b>NORTHERN PLATEAU.</b>					
Missoula, Fort, Mont. <sup>1</sup> .....	NW. to NE.	S. to W.	SW. to NW.	SW. to NW.	SE. to SW.
Boise, Idaho.....	E. to S.	NE. to SE.	E. to S.	W. to N.	W. to N.
Eagle Rock, Idaho <sup>1</sup> .....	SW. to NW.	SE. to SW.	Variable.	S. to W.	S. to W.
Lewiston, Idaho.....	NE. to SE.	SE. to SW.	NE. to SE.	NE. to SE.	SW. to NW.
Umatilla, Oreg. <sup>2</sup> .....	NE. to SE.	SW. to NW.	SW. to NW.	N. to E.	SW. to NW.
Dayton, Wash. T. <sup>3</sup> .....	S. to W.	S. to W.	S. to W.	SE. to SW.	S. to W.
Spokane Falls, Wash. T. <sup>3</sup> .....	SW. to NW.	SE. to SW.	E. to S.	SE. to SW.	S. to W.
<b>NORTH PACIFIC COAST.</b>					
Canby, Fort, Wash. T. <sup>3</sup> .....	SE. to SW.	SE. to SW.	S. to W.	S. to W.	S. to W.
Olympia, Wash. T. <sup>3</sup> .....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Tatoosh Island, Wash. T. <sup>3</sup> .....	SE. to SW.	SE. to SW.	S. to W.	SW. to NW.	SW. to NW.
Roseburg, Oreg. <sup>3</sup> .....	SE. to SW.	SE. to SW.	S. to W.	SW. to NW.	SW. to NW.
<b>MIDDLE PACIFIC COAST.</b>					
Cape Mendocino, Cal. <sup>3</sup> .....	W. to N.	SW. to NW.	NE. to SE.	NE. to SE.	SE. to SW.
Red Bluff, Cal. <sup>3</sup> .....	SE. to SW.	SE. to SW.	SE. to SW.	E. to S.	SE. to SW.
Sacramento, Cal. <sup>3</sup> .....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
San Francisco, Cal. <sup>3</sup> .....	SE. to SW.	SE. to SW.	S. to W.	S. to W.	S. to W.
<b>SOUTH PACIFIC COAST.</b>					
Campo, Cal. <sup>3</sup> .....	SW. to NW.	S. to W.	S. to W.	S. to W.	S. to W.
Los Angeles, Cal. <sup>3</sup> .....	NE. to SE.	NE. to SE.	SE. to SW.	SE. to SW.	S. to W.
San Diego, Cal. <sup>3</sup> .....	SE. to SW.	S. to W.	S. to W.	SW. to NW.	S. to W.
Visalia, Cal. <sup>1</sup> .....	E. to S.	E. to S.	SE. to SW.	SE. to SW.	SW. to NW.

<sup>1</sup> Station closed June 15, 1883.    <sup>2</sup> Station closed March 31, 1883.    <sup>3</sup> Station opened September 1, 1883.

or snow are observed to blow at stations of the Signal Service, &c.—Continued.

June.	July.	August.	September.	October.	November.	December.
SE. to SW. NW. to NE. NE. to SE.	S. to W. SW. to NW. SE. to SW.	SE. to SW. S. to W. E. to S.	SE. to SW. S. to W. E. to S.	SE. to SW. S. to W. E. to S.	SE. to SW. S. to W. SW. to NW.	SE. to SW. S. to W. SE. to SW.
SW. to NW. SW. to NW. S. to W. SW. to NW. S. to W. SE. to SW. SE. to SW.	W. to N. Variable. N. to E. NE. to SE. SW. to NW. S. to W. S. to W.	W. to N. NW. to NE. NW. to NE. SW. to NW. SW. to NW. S. to W. S. to W.	NW. to NE. SW. to NW. NW. to NE. SW. to NW. SW. to NW. SW. to NW. SW. to NW.	SW. to NW. SW. to NW. S. to W. NE. to SE. SW. to NW. S. to W. SE. to SW.	NW. to NE. SE. to SW. SW. to NW. NE. to SE. NE. to SE. S. to W. E. to S.	W. to N. NE. to SE. SW. to NW. E. to S. SE. to SW. S. to W. S. to W.
S. to W.	S. to W.	S. to W.	SE. to SW. S. to W.	W. to N. S. to W. SW. to NW.	S. to W. S. to W. E. to S.	SE. to SW. S. to W. E. to S.
SE. to SW. W. to N.	SE. to SW. SW. to NW.	SE. to SW. SW. to NW.	SE. to SW. SW. to NW.	SE. to SW. S. to W.	SE. to SW. SE. to SW.	E. to S. SE. to SW.
No precipi- tation. SE. to SW. SE. to SW. S. to W.	No precipi- tation. SE. to SW. S. to W. S. to W.	No precipi- tation. S. to W. S. to W. S. to W.	SE. to SW. SE. to SW. SE. to SW. S. to W.	SE. to SW. E. to S. SE. to SW. S. to W.	SW. to NW. E. to S. SE. to SW. S. to W.	SE. to SW. SE. to SW. SE. to SW. SE. to SW.
S. to W. SE. to SW. S. to W. SW. to NW.	No precipi- tation. No precipi- tation. S. to W. No precipi- tation.	SW. to NW. No precipi- tation. SW. to NW.	SW. to NW. No precipi- tation. NW. to NE. SE. to SW.	SW. to NW. S. to W. S. to W. W. to N.	SW. to NW. SE. to SW. S. to W. SW. to NW.	SW. to NW. E. to S. S. to W. E. to S.

\* Station opened October 1, 1883.

\* Station closed September 30, 1883.

## APPENDIX 73.

Table showing the quadrants from which the winds least likely to be followed by rain or snow of the

[Computed from observations taken during a period of

Stations.	January.	February.	March.	April.	May.
<b>NEW ENGLAND.</b>					
Eastport, Me. ....	W. to N.	W. to N.	W. to N.	SW. to NW.	W. to N.
Portland, Me. ....	E. to S.	E. to S.	W. to N.	W. to N.	W. to N.
Burlington, Vt. <sup>1</sup> .....	SW. to NW.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
Boston, Mass. ....	N. to E.	W. to N.	SW. to NW.	NW. to NE.	W. to N.
Provincetown, Mass. ....	W. to N.	NE. to SE.	SW. to NW.	W. to N.	W. to N.
Springfield, Mass. <sup>2</sup> .....	NE. to SE.	NE. to SE.	NE. to SE.	SW. to NW.	SW. to NW.
Thatcher's Island, Mass. <sup>3</sup> .....	N. to E.	W. to N.	W. to N.	W. to N.	W. to N.
Wood's Holl, Mass. <sup>4</sup> .....	NW. to NE.	W. to N.	W. to N.	W. to N.	W. to N.
Block Island, R. I. ....	W. to N.	N. to E.	E. to S.	W. to N.	E. to S.
Newport, R. I. <sup>5</sup> .....	W. to N.	NW. to NE.	W. to N.	W. to N.	W. to N.
New Haven, Conn. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
New London, Conn. ....	NE. to SE.	NE. to SE.	NW. to NE.	W. to N.	W. to N.
<b>MIDDLE ATLANTIC STATES.</b>					
Albany, N. Y. ....	NE. to SE.	NE. to SE.	N. to E.	NE. to SE.	N. to E.
New York City .....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Philadelphia, Pa. ....	W. to N.	W. to N.	W. to N.	NW. to NE.	W. to N.
Williamsport, Pa. <sup>1</sup> .....	S. to W.	NW. to NE.	SW. to NW.	NW. to NE.	NW. to NE.
Atlantic City, N. J. ....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Barnegat City, N. J. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Cape May, N. J. ....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Sandy Hook, N. J. ....	SW. to NW.	SW. to NW.	W. to N.	SW. to NW.	W. to N.
Delaware Breakwater, Del. ....	SW. to NW.	W. to N.	W. to N.	NW. to NE.	NW. to NE.
Baltimore, Md. ....	E. to S.	W. to N.	SW. to NW.	S. to W.	W. to N.
Washington City .....	W. to N.	W. to N.	SW. to NW.	W. to N.	W. to N.
Cape Henry, Va. ....	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.	SW. to NW.
Chincoteague, Va. ....	SW. to NW.	W. to N.	W. to N.	W. to N.	W. to N.
Lynchburg, Va. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Norfolk, Va. ....	W. to N.	W. to N.	W. to N.	W. to N.	NW. to NE.
<b>SOUTH ATLANTIC STATES.</b>					
Cape Lookout, N. C. <sup>6</sup> .....	W. to N.	E. to S.	W. to N.	NW. to NE.	W. to N.
Charlotte, N. C. ....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Hatteras, N. C. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Kitty Hawk, N. C. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Macon, Fort, N. C. ....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Portsmouth, N. C. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Smithville, N. C. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Wilmington, N. C. ....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Charleston, S. C. ....	E. to S.	SE. to SW.	W. to N.	W. to N.	W. to N.
Augusta, Ga. ....	W. to N.	W. to N.	W. to N.	NW. to NE.	W. to N.
Savannah, Ga. ....	W. to N.	SW. to NW.	NW. to NE.	W. to N.	W. to N.
Jacksonville, Fla. ....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
<b>FLORIDA PENINSULA.</b>					
Cedar Keys, Fla. ....	SW. to NW.	SW. to NW.	SW. to NW.	NW. to NE.	W. to N.
Key West, Fla. ....	W. to N.	SW. to NW.	W. to N.	SW. to NW.	SW. to NW.
Punta Rasa, Fla. <sup>1</sup> .....	W. to N.	W. to N.	N. to E.	NW. to NE.	NW. to NE.
Sanford, Fla. ....			(7)	NE. to SE.	NW. to NE.
<b>EASTERN GULF STATES.</b>					
Atlanta, Ga. ....	W. to N.	W. to N.	NW. to NE.	NW. to NE.	NW. to NE.
Pensacola, Fla. ....	W. to N.	SW. to NW.	W. to N.	NW. to NE.	W. to N.

<sup>1</sup> Station closed June 15, 1883.

<sup>2</sup> Station closed December 31, 1882.

<sup>3</sup> Changed to a third-class station May 31, 1883.

<sup>4</sup> Station closed January 31, 1883.

<sup>5</sup> Station closed March 31, 1883.

<sup>6</sup> Station closed December 31, 1880.

<sup>7</sup> Made a first-class station March 22, 1883.

## APPENDIX 73.

are observed to blow at stations of the Signal Service, United States Army, during each month year.

from one to thirteen years—1871 to 1883, inclusive.]

June.	July.	August.	September.	October.	November.	December.
W. to N. W. to N. NE. to SE. NW. to NE. N. to E. NE. to SE. NE. to SE. NW. to NE.	NE. to SE. W. to N. NE. to SE. NW. to NE. NW. to NE. W. to N. NW. to NE. NW. to NE.	W. to N. W. to N. NE. to SE. W. to N. NE. to SE. W. to N. W. to N. W. to N.	W. to N. W. to N. NE. to SE. W. to N. W. to N. SW. to NW. W. to N. W. to N.	W. to N. W. to N. NE. to SE. W. to N. SW. to NW. SW. to NW. W. to N. NW. to NE.	W. to N. W. to N. SW. to NW. NW. to NE. W. to N. SW. to NW. W. to N. NW. to NE.	W. to N. E. to S. SW. to NW. N. to E. NE. to SE. W. to N. W. to N. W. to N.
N. to E. W. to N. W. to N. W. to N.	W. to N. NW. to NE. W. to N. W. to N.	W. to N. W. to N. W. to N. NW. to NE.	W. to N. W. to N. W. to N. W. to N.	W. to N. W. to N. W. to N. W. to N.	E. to S. W. to N. W. to N. W. to N.	W. to N. E. to S. W. to N. E. to S.
NE. to SE. W. to N. NW. to NE. Variable.	N. to E. W. to N. N. to E. {S. to W. N. to E.}	NE. to SE. W. to N. NW. to NE. NW. to NE.	NE. to SE. W. to N. W. to N. Variable.	NE. to SE. W. to N. W. to N. NW. to NE.	NE. to SE. W. to N. W. to N. SE. to SW.	NE. to SE. W. to N. W. to N. SW. to NW.
NE. to SE. NW. to NE. NW. to NE. W. to N. N. to E. N. to E. N. to N. N. to E. NW. to NE. NW. to NE.	W. to N. SW. to NW. NW. to NE. W. to N. N. to E. N. to E. W. to N. W. to N. NW. to NE. W. to N.	W. to N. W. to N. W. to N. W. to N. NW. to NE. W. to N. W. to N. W. to N. W. to N. W. to N.	W. to N. W. to N. W. to N. W. to N. SW. to NW. SW. to NW. W. to N. W. to N. W. to N. W. to N.	W. to N. W. to N. SW. to NW. W. to N. W. to N. SW. to NW. W. to N. W. to N. NW. to NE. W. to N.	W. to N. W. to N. SW. to NW. W. to N. E. to S. W. to N. SW. to NW. W. to N. W. to N. SW. to NW.	W. to N. W. to N. SW. to NW. W. to N. NE. to SE. W. to N. SW. to NW. W. to N. NE. to SE. W. to N.
N. to E. NW. to NE. W. to N. NW. to NE. W. to N. NW. to NE. W. to N. NW. to NE. W. to N. NW. to NE.	NW. to NE. W. to N. W. to N. NW. to NE. E. to S. W. to N. W. to N. W. to N. NW. to NE. W. to N.	W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N.	W. to N. W. to N. SW. to NW. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N.	W. to N. W. to N. W. to N. W. to N. W. to N. SW. to NW. W. to N. W. to N. SW. to NW. W. to N.	SW. to NW. W. to N. W. to N. W. to N. E. to S. W. to N. SW. to NW. W. to N. SW. to NW. SW. to NW.	W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N. W. to N.
NW. to NE. W. to N. NW. to NE. W. to N.	NW. to NE. W. to N. NW. to NE. NW. to NE.	NW. to NE. W. to N. NW. to NE. S. to W.	NW. to NE. W. to N. W. to N. W. to N.	W. to N. SW. to NW. W. to N. Variable.	SW. to NW. SW. to NW. NW. to NE. SE. to SW.	SW. to NW. W. to N. W. to N. Variable.
NW. to NE. NW. to NE.	N. to E. E. to S.	NW. to NE. W. to N.	NW. to NE. SW. to NW.	S. to W. W. to N.	W. to N. SW. to NW.	W. to N. W. to N.

Table showing the quadrants from which the winds least likely to be followed by rain

Stations.	January.	February.	March.	April.	May.
<b>EASTERN GULF STATES—Cont'd.</b>					
Mobile, Ala.	SW. to NW.	SW. to NW.	W. to N.	W. to N.	W. to N.
Montgomery, Ala.	W. to N.	SW. to NW.	W. to N.	W. to N.	W. to N.
Starkville, Miss. <sup>1</sup>	SW. to NW.	Variable.	Variable.	NW. to NE.	NW. to NE.
Vicksburg, Miss.	W. to N.	W. to N.	W. to N.	W. to N.	NW. to NE.
New Orleans, La.	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
<b>WESTERN GULF STATES.</b>					
Port Eads, La. <sup>2</sup>	SW. to NW.	SW. to NW.	NW. to NE.	NW. to NE.	NW. to NE.
Shreveport, La.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.	NW. to NE.
Fort Smith, Ark.	SE. to SW.	Variable.	NW. to NE.	W. to N.	NW. to NE.
Little Rock, Ark.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.	W. to N.
Gibson, Fort, Ind. T. <sup>3</sup>	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	NW. to NE.
Boerne, Tex. <sup>4</sup>	Variable.	SW. to NW.	S. to W.	S. to W.	SW. to NW.
Corpusaca, Tex. <sup>5</sup>	SW. to NW.	W. to N.	SW. to NW.	SW. to NW.	SW. to NW.
Decatur, Tex. <sup>6</sup>	SW. to NW.	SW. to NW.	NW. to NE.	N. to E.	W. to N.
Denison, Tex. <sup>7</sup>	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.
Fredericksburg, Tex. <sup>8</sup>	SW. to NW.	NE. to SE.	SW. to NW.	N. to E.	W. to N.
Galveston, Tex.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.	SW. to NW.
Indianola, Tex.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Mason, Tex. <sup>9</sup>	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	NW. to NE.
Palestine, Tex.	SW. to NW.	W. to N.	NW. to NE.	NW. to NE.	W. to N.
Pilot Point, Tex. <sup>10</sup>	E. to S.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
San Antonio, Tex. <sup>11</sup>	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
<b>RIO GRANDE VALLEY.</b>					
Brackettville, Tex. <sup>12</sup>	SW. to NW.	SW. to NW.	S. to W.	SW. to NW.	SW. to NW.
Brownsville, Tex.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.
Castroville, Tex. <sup>13</sup>	S. to W.	S. to W.	SW. to NW.	SW. to NW.	SW. to NW.
Eagle Pass, Tex. <sup>14</sup>	S. to W.	SW. to NW.	SW. to NW.	SW. to NW.	S. to W.
Edinburg, Tex. <sup>15</sup>	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	Variable.
Laredo, Tex. <sup>16</sup>	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Rio Grande City, Tex.	S. to W.	S. to W.	S. to W.	W. to N.	SW. to NW.
Uvalde, Tex.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.	W. to N.
<b>OHIO VALLEY AND TENNESSEE.</b>					
Chattanooga, Tenn.	W. to N.	N. to E.	N. to E.	W. to N.	NW. to NE.
Knoxville, Tenn.	E. to S.	E. to S.	W. to N.	E. to S.	E. to S.
Memphis, Tenn.	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Nashville, Tenn.	W. to N.	W. to N.	SW. to NW.	W. to N.	W. to N.
Louisville, Ky.	W. to N.	W. to N.	W. to N.	W. to N.	NW. to NE.
Indianapolis, Ind.	N. to E.	NW. to NE.	W. to N.	W. to N.	NW. to NE.
Cincinnati, Ohio.	N. to E.	NW. to NE.	NW. to NE.	NW. to NE.	NW. to NE.
Columbus, Ohio.	NW. to NE.	NW. to NE.	W. to N.	W. to N.	NW. to NE.
Morgantown, W. Va. <sup>17</sup>	W. to N.	W. to N.	N. to E.	NW. to NE.	NW. to NE.
Pittsburg, Pa.	NW. to NE.	NW. to NE.	W. to N.	N. to E.	N. to E.
<b>LOWER LAKES.</b>					
Buffalo, N. Y.	NW. to NE.	NW. to NE.	NW. to NE.	W. to N.	W. to N.
Oswego, N. Y.	N. to E.	N. to E.	N. to E.	SW. to NW.	N. to E.
Rochester, N. Y.	N. to E.	NW. to NE.	N. to E.	NW. to NE.	N. to E.
Erie, Pa.	N. to E.	N. to E.	N. to E.	NW. to NE.	N. to E.
Cleveland, Ohio.	NW. to NE.	N. to E.	NW. to NE.	W. to N.	W. to N.
Sandusky, Ohio.	NW. to NE.	N. to E.	NW. to NE.	NW. to NE.	NW. to NE.
Toledo, Ohio.	NW. to NE.	W. to N.	W. to N.	W. to N.	NW. to NE.
Detroit, Mich.	NW. to NE.	NW. to NE.	NW. to NE.	W. to N.	W. to N.
<b>UPPER LAKES.</b>					
Alpena, Mich.	N. to E.	N. to E.	NW. to NE.	S. to W.	NW. to NE.
Escanaba, Mich.	NE. to SE.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Grand Haven, Mich.	NW. to NE.	NW. to NE.	NW. to NE.	W. to N.	W. to N.
Mackinaw City, Mich.	NW. to NE.	NW. to NE.	NE. to SE.	S. to W.	NW. to NE.
Marquette, Mich.	NE. to SE.	N. to E.	N. to E.	S. to W.	SW. to NW.
Port Huron, Mich.	NW. to NE.	NW. to NE.	W. to N.	SW. to NW.	SW. to NW.
Champaign, Ill. <sup>18</sup>	SW. to NW.	SW. to NW.	W. to N.	W. to N.	W. to N.
Chicago, Ill.	N. to E.	NW. to NE.	W. to N.	W. to N.	W. to N.
Milwaukee, Wis.	N. to E.	NW. to NE.	W. to N.	W. to N.	W. to N.
Duluth, Minn.	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.

<sup>1</sup> Station closed June 15, 1883.

<sup>2</sup> Station closed March 31, 1883.

<sup>3</sup> Station closed May 13, 1882.

<sup>4</sup> Station closed July 28, 1880.

<sup>5</sup> Station closed October 31, 1881.

<sup>6</sup> Station closed September 10, 1882.

*or snow are observed to blow at stations of the Signal Service, &c.—Continued.*

[illegible]

<sup>†</sup> Station closed February 25, 1883.

• Station closed April 15, 1882.

\* Station closed March 31, 1881.

<sup>10</sup> Reduced to third-class station December 16, 1882.

<sup>11</sup> Station closed March 29, 1882.

<sup>19</sup> Reduced to third-class station February 12, 1881.



Table showing the quadrants from which the winds least likely to be followed by rain

Stations.	January.	February.	March.	April.	May.
<b>UPPER MISSISSIPPI VALLEY.</b>					
Saint Paul, Minn.....	S. to W.	S. to W.	SW. to NW.	SW. to NW.	SW. to NW.
La Crosse, Wis.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Madison, Wis. <sup>1</sup> .....	NW. to NE.	W. to N.	W. to N.	SW. to NW.	W. to N.
Davenport, Iowa.....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Des Moines, Iowa.....	SW. to NW.	S. to W.	SW. to NW.	W. to N.	W. to N.
Dubuque, Iowa.....	W. to N.	SW. to NW.	SW. to NW.	W. to N.	W. to N.
Keokuk, Iowa.....	W. to N.	S. to W.	SW. to NW.	W. to N.	SW. to NW.
Calro, Ill.....	W. to N.	SW. to NW.	W. to N.	W. to N.	NW. to NE.
Springfield, Ill.....	W. to N.	SW. to NW.	S. to W.	SW. to NW.	N. to E.
Saint Louis, Mo.....	W. to N.	W. to N.	W. to N.	NW. to NE.	NW. to NE.
<b>MISSOURI VALLEY.</b>					
Springfield, Mo. <sup>2</sup> .....	W. to N.	W. to N.	W. to N.	W. to N.	N. to E.
Leavenworth, Kans.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Omaha, Nebr.....	SW. to NW.	SW. to NW.	S. to W.	SW. to NW.	SW. to NW.
Bennett, Fort, Dak.....	SE. to SW.	S. to W.	S. to W.	S. to W.	S. to W.
Huron, Dak.....	S. to W.	S. to W.	S. to W.	SW. to NW.	S. to W.
Yankton, Dak.....	S. to W.	S. to W.	S. to W.	S. to W.	W. to N.
<b>EXTREME NORTHWEST.</b>					
Breckenridge, Minn. <sup>3</sup> .....	S. to W.	S. to W.	S. to W.	S. to W.	NW. to NE.
Moorhead, Minn.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	N. to E.
Saint Vincent, Minn.....	N. to E.	N. to E.	SW. to NW.	S. to W.	SW. to NW.
Bismarck, Dak.....	S. to W.	S. to W.	SW. to NW.	SW. to NW.	S. to W.
Butord, Fort, Dak.....	E. to S.	SW. to NW.	S. to W.	S. to W.	W. to N.
Stevenson, Fort, Dak. <sup>3</sup> .....	S. to W.	N. to E.	S. to W.	SW. to NW.	SW. to NW.
<b>NORTHERN SLOPE.</b>					
Assinaboine, Fort, Mont.....	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Benton, Fort, Mont.....	SE. to SW.	NW. to NE.	E. to S.	SE. to SW.	SE. to SW.
Billings, Mont. <sup>4</sup> .....	{ W. to N. } { E. to S. }	E. to S.	SE. to SW.	SE. to SW.	W. to N.
Custer, Fort, Mont.....	N. to E.	NE. to SE.	NE. to SE.	S. to W.	S. to W.
Helena, Mont.....	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
Keogh, Fort, Mont. <sup>5</sup> .....	NE. to SE.	E. to S.	E. to S.	S. to W.	S. to W.
Maginnis, Fort, Mont.....	E. to S.	NE. to SE.	E. to S.	Variable.	Variable.
Poplar River, Mont.....	E. to S.	S. to W.	N. to E.	Variable.	S. to W.
Shaw, Fort, Mont.....	E. to S.	E. to S.	E. to S.	E. to S.	SE. to SW.
Virginia City, Mont. <sup>5</sup> .....	NW. to NE.	N. to E.	E. to S.	NW. to NE.	N. to E.
Deadwood, Dak.....	E. to S.	E. to S.	E. to S.	E. to S.	W. to N.
Cheyenne, Wyo.....	E. to S.	S. to W.	E. to S.	S. to W.	S. to W.
Washakie, Fort, Wyo. <sup>5</sup> .....	NE. to SE.	SE. to SW.	S. to W.	N. to E.	SE. to SW.
North Platte, Nebr.....	S. to W.	S. to W.	S. to W.	S. to W.	SW. to NW.
<b>MIDDLE SLOPE.</b>					
Denver, Colo.....	NE. to SE.	SW. to NW.	SE. to SW.	E. to S.	SE. to SW.
West Las Animas, Colo.....	S. to W.	Variable.	Variable.	NW. to NE.	S. to W.
Dodge City, Kans.....	S. to W.	SW. to NW.	S. to W.	SW. to NW.	W. to N.
Elliott, Fort, Tex.....	{ N. to E. } { S. to W. }	E. to S.	SE. to SW.	SW. to NW.	SW. to NW.
<b>SOUTHERN SLOPE.</b>					
Sill, Fort, Ind. T.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Coleman City, Tex. <sup>6</sup> .....	S. to W.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Concho, Fort, Tex.....	SE. to SW.	SW. to NW.	SW. to NW.	N. to E.	SW. to NW.
Davis, Fort, Tex.....	E. to S.	E. to S.	SW. to NW.	SW. to NW.	W. to N.
Griffin, Fort, Tex. <sup>7</sup> .....	SW. to NW.	S. to W.	SW. to NW.	SW. to NW.	NW. to NE.
Henrietta, Tex. <sup>1</sup> .....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.
Jacksborough, Tex. <sup>2</sup> .....	Variable.	W. to N.	SW. to NW.	N. to E.	NW. to NE.
McKavett, Fort, Tex. <sup>3</sup> .....	SW. to NW.	NW. to NE.	SW. to NW.	SW. to NW.	W. to N.
Stockton, Fort, Tex.....	S. to W.	Variable.	W. to N.	SW. to NW.	SW. to NW.
<b>SOUTHERN PLATEAU.</b>					
La Mesilla, N. Mex. <sup>8</sup> .....	S. to W.	S. to W.	N. to E.	NW. to NE.	Variable.
Santa Fé, N. Mex. <sup>2</sup> .....	W. to N.	NE. to SE.	N. to E.	N. to E.	N. to E.

<sup>1</sup> Station closed March 31, 1883.<sup>2</sup> Station closed June 15, 1883.<sup>3</sup> Station closed November 30, 1880.<sup>4</sup> Station closed June 24, 1883.<sup>5</sup> Station closed November 18, 1880.

or snow are observed to blow at stations of the Signal Service, &c.—Continued.

June.	July.	August.	September.	October.	November.	December.
NW. to NE. N. to E. NW. to NE. NW. to NE. NW. to NE. N. to E. W. to N. W. to N. N. to E. NW. to NE.	N. to E. N. to E. NW. to NE. W. to N. NW. to NE. W. to N. NW. to NE. NW. to NE. NE. to SE. W. to N.	NW. to NE. SW. to NW. SW. to NW. W. to N. W. to N. NW. to NE. SW. to NW. W. to N. W. to N. W. to N. NW. to NE.	W. to N. SW. to NW. W. to N. NW. to NE. NW. to NE. N. to E. W. to N. W. to N. W. to N. N. to E.	N. to E. SW. to NW. SW. to NW. W. to N. NW. to NE. NW. to NE. W. to N. N. to E. NW. to NE. W. to N.	NW. to NE. SW. to NW. W. to N. NW. to NE. SW. to NW. N. to E. NW. to NE. W. to N. W. to N. SW. to NW.	S. to W. SW. to NW. NW. to NE. NW. to NE. SW. to NW. NW. to NE. S. to W. SW. to NW. W. to N. SW. to NW.
W. to N. SW. to NW. SW. to NW. S. to W. SW. to NW. W. to N.	W. to N. SW. to NW. SW. to NW. S. to W. S. to W. W. to N.	NE. to SE. SW. to NW. SW. to NW. S. to W. S. to W. SW. to NW.	SW. to NW. N. to E. SW. to NW. S. to W. S. to W. SW. to NW.	SW. to NW. SW. to NW. SW. to NW. SW. to NW. SW. to NW. S. to W.	NW. to NE. SW. to NW. SW. to NW. S. to W. S. to W. S. to W.	SW. to NW. SW. to NW. SW. to NW. S. to W. S. to W. S. to W.
NW. to NE. W. to N. W. to N. SW. to NW. W. to N.	SW. to NW. S. to W. N. to E. S. to W. NW. to NE. S. to W.	SW. to NW. S. to W. N. to E. NW. to NE. S. to W. SW. to NW.	S. to W. SW. to NW. NW. to NE. S. to W. SE. to SW. S. to W.	N. to E. SW. to NW. S. to W. S. to W. SE. to SW. SE. to SW.	{S. to W. N. to E.} SW. to NW. N. to E. S. to W. SE. to SW. NE. to SE.	N. to E. SW. to NW. N. to E. S. to W. SE. to SW. SE. to SW.
NE. to SE. E. to S. W. to N.	NE. to SE. E. to S.	SW. to NW. SE. to SW.	NW. to NE. E. to S.	{E. to S. W. to N.} E. to S.	E. to S. E. to S.	E. to S. E. to S.
E. to S. NE. to SE. S. to W. E. to S. S. to W. SE. to SW. N. to E. SW. to NW. SW. to NW. SE. to SW. SW. to NW.	SE. to SW. NE. to SE. E. to S. E. to S. E. to S. NW. to NE. N. to E. E. to S. SW. to NW. N. to E. SW. to NW.	S. to W. NE. to SE. SE. to SW. Variable. SW. to NW. SE. to SW. SE. to SW. SE. to SW. W. to N. N. to E. Variable. SW. to NW.	SE. to SW. N. to E. SE. to SW. SE. to SW. S. to W. SE. to SW. E. to S. NE. to SE. NE. to SE. S. to W. S. to W.	SE. to SW. NE. to SE. SE. to SW. E. to S. N. to E. E. to S. NE. to SE. E. to S. N. to E. SW. to NW.	E. to S. NE. to SE. NE. to SE. E. to S. E. to S. E. to S. N. to E. E. to S. NE. to SE. NE. to SE. S. to W.	S. to W. NE. to SE. E. to S. E. to S. S. to W. E. to S. NE. to SE. NE. to SE. SE. to SW.
S. to W. SW. to NW. W. to N. SW. to NW.	S. to W. W. to N. SW. to NW. W. to N.	S. to W. S. to W. SW. to NW. W. to N.	SE. to SW. Variable. SW. to NW. W. to N.	S. to W. SW. to NW. SW. to NW. SW. to NW.	S. to W. Variable. SW. to NW. S. to W.	S. to W. SE. to SW. SW. to NW. SW. to NW.
SW. to NW. W. to N. SW. to NW. NW. to NE. SW. to NW. SW. to NW. SW. to NW. SW. to NW. NW. to NE. W. to N.	SW. to NW. W. to N. SW. to NW. W. to N. SW. to NW. SW. to NW. W. to N. SW. to NW. W. to N.	SW. to NW. W. to N. W. to N. SW. to NW. SW. to NW. SW. to NW. SW. to NW. SW. to NW. W. to N.	SW. to NW. W. to N. W. to N. E. to S. SW. to NW. SW. to NW. SW. to NW. SW. to NW. S. to W.	W. to N. SW. to NW. SW. to NW. W. to N. SW. to NW. SW. to NW. SW. to NW. SW. to NW. W. to N.	SW. to NW. SW. to NW. S. to W. E. to S. SW. to NW. SW. to NW. S. to W. SE. to SW. S. to W.	SW. to NW. SW. to NW. SW. to NW. Variable. SW. to NW. SW. to NW. W. to N. SE. to SW.
N. to E. NW. to NE.	N. to E. N. to E.	NW. to NE. SW. to NW.	SE. to SW. N. to E.	NW. to NE. W. to N.	Variable. W. to N.	Variable. Variable.

\* Station closed August, 1883.

† Station closed April 14, 1882.

‡ Station closed February, 1883.

§ Station closed August 5, 1882.

Table showing the quadrants from which the winds least likely to be followed by rain

Stations.	January.	February.	March.	April.	May.
<b>SOUTHERN PLATEAU—Cont'd.</b>					
Silver City, N. Mex. <sup>1</sup> .....	NE. to SE.	NE. to SE.	N. to E.	NW. to NE.	NE. to SE.
Socorro, N. Mex. <sup>2</sup> .....	NE. to SE.	NE. to SE.	N. to E.	W. to N.	SW. to NW.
El Paso, Tex. ....	SE. to SW.	SE. to SW.	SE. to SW.	NE. to SE.	W. to N.
Apache, Fort, Ariz. ....	NW. to NE.	NW. to NE.	W. to N.	NW. to NE.	W. to N.
Burkes, Ariz. <sup>3</sup> .....	NW. to NE.	NW. to NE.	Variable.	N. to E.	Variable.
Florence, Ariz. <sup>4</sup> .....	NE. to SE.	NW. to NE.	W. to N.	NE. to SE.	Variable.
Grant, Fort, Ariz. ....	SE. to SW.	SW. to NW.	N. to E.	N. to E.	NE. to SE.
Phoenix, Ariz. <sup>4</sup> .....	NW. to NE.	NW. to NE.	NE. to SE.	NE. to SE.	Variable.
Prescott, Ariz. ....	NW. to NE.	NW. to NE.	NW. to NE.	NW. to NE.	SW. to NW.
Thomas, Fort, Ariz. ....	NE. to SE.	NE. to SE.	N. to E.	NE. to SE.	SW. to NW.
Tucson, Ariz. <sup>5</sup> .....	NW. to NE.	N. to E.	NW. to NE.	N. to E.	NW. to NE.
Verde, Fort, Ariz. <sup>6</sup> .....	NE. to SE.	N. to E.	N. to E.	N. to E.	NW. to NE.
Wickenburg, Ariz. <sup>7</sup> .....	NW. to NE.	NW. to NE.	NW. to NE.	N. to E.	Variable.
Yuma, Ariz. ....	NW. to NE.	SW. to NW.	N. to E.	NE. to SE.	No precipitation.
<b>MIDDLE PLATEAU.</b>					
Pioche, Nev. <sup>4</sup> .....	NE. to SE.	N. to E.	NE. to SE.	NE. to SE.	NE. to SE.
Winnemucca, Nev. <sup>5</sup> .....	{ E. to S. W. to N. }	W. to N.	NE. to SE.	E. to S.	E. to S.
Salt Lake City, Utah. ....	N. to E.	NW. to NE.	N. to E.	S. to W.	N. to E.
<b>NORTHERN PLATEAU.</b>					
Missoula, Fort, Mont. <sup>4</sup> .....	E. to S.	W. to N.	N. to E.	E. to S.	NE. to SE.
Boise City, Idaho ....	N. to E.	NW. to NE.	NW. to NE.	NE. to SE.	N. to E.
Eagle Rock, Idaho <sup>4</sup> .....	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.	NE. to SE.
Lewiston, Idaho ....	Variable.	NW. to NE.	SE. to SW.	NW. to NE.	NW. to NE.
Umatilla, Oreg. <sup>5</sup> .....	NW. to NE.	NW. to NE.	N. to E.	SE. to SW.	E. to S.
Dayton, Wash. T. ....	NE. to SE.	N. to E.	NW. to NE.	N. to E.	NW. to NE.
Spokane Falls, Wash. T. ....	E. to S.	W. to N.	NW. to NE.	W. to N.	W. to N.
<b>NORTH PACIFIC COAST.</b>					
Canby, Fort, Wash. T. <sup>6</sup> .....					
Olympia, Wash. T. ....	NE. to SE.	NW. to NE.	NE. to SE.	NE. to SE.	NE. to SE.
Tatoosh Island, Wash. T. <sup>10</sup> .....					
Portland, Oreg. ....	NW. to NE.	NW. to NE.	N. to E.	N. to E.	N. to E.
Roseburg, Oreg. ....	NW. to NE.	NW. to NE.	NE. to SE.	NE. to SE.	NE. to SE.
<b>MIDDLE PACIFIC COAST.</b>					
Cape Mendocino, Cal. ....	{ N. to E. S. to W. }	N. to E.	Variable.	S. to W.	N. to E.
Red Bluff, Cal. ....	N. to E.	NW. to NE.	N. to E.	NW. to NE.	N. to E.
Sacramento, Cal. ....	NW. to NE.	NW. to NE.	NW. to NE.	NW. to NE.	NW. to NE.
San Francisco, Cal. ....	N. to E.	N. to E.	NW. to NE.	N. to E.	N. to E.
<b>SOUTH PACIFIC COAST.</b>					
Campo, Cal. <sup>11</sup> .....	NW. to NE.	NW. to NE.	NW. to NE.	NE. to SE.	E. to S.
Los Angeles, Cal. ....	W. to N.	W. to N.	NW. to NE.	NW. to NE.	NW. to NE.
San Diego, Cal. ....	NW. to NE.	NW. to NE.	N. to E.	NE. to SE.	N. to E.
Visalia, Cal. <sup>5</sup> .....	S. to W.	NW. to NE.	W. to N.	N. to E.	NE. to SE.

<sup>1</sup> Station closed March 31, 1893.<sup>2</sup> Station closed May 23, 1891.<sup>3</sup> Station closed December, 1893.<sup>4</sup> Changed to third-class station December 31, 1891.<sup>5</sup> Station closed June 15, 1893.

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June.	July.	August.	September.	October.	November.	December.
N. to E. SW. to NW. SW. to NW. SE. to SW. No precipitation. No precipitation. NW. to NE. Variable. NW. to NE. NW. to NE. NW. to NE. NW. to NE. NW. to NE. SW. to NW. Variable.	N. to E. NE. to SE. SE. to SW. NW. to NE. NW. to NE. NW. to NE. NE. to SE. NW. to NE. Variable. NW. to NE. NW. to NE. SE. to SW. N. to E. N. to E. NW. to NE. NW. to NE.	NE. to SE. NW. to NE. S. to W. NW. to NE. NW. to NE. NE. to SE. N. to E. W. to N. NE. to SE. N. to E. N. to E. NW. to NE. NW. to NE. NW. to NE.	N. to E. NE. to SE. SE. to SW. NW. to NE. S. to W. NW. to NE. Variable. NW. to NE. W. to N. NW. to NE. NW. to NE. NW. to NE. NW. to NE. Variable.	NW. to NE. Variable. NW. to NE. W. to N. NW. to NE. N. to E. NW. to NE. NW. to NE. NW. to NE. Variable.	NW. to NE. Variable. SE. to SW. W. to N. Variable. Variable. SW. to NW. NW. to NE. NW. to NE. S. to W. W. to N. NW. to NE. Variable. SE. to SW.	N. to E. SE. to SW. SE. to SW. W. to N. NE. to SE. NW. to NE. N. to E. NW. to NE. NW. to NE. NE. to SE. NW. to NE.
NE. to SE. E. to S. S. to W.	NE. to SE. NE. to SE. N. to E.	NE. to SE. NE. to SE. N. to E.	NE. to SE. NE. to SE. N. to E.	NW. to NE. W. to N. N. to E.	Variable. NW. to NE. N. to E.	NW. to NE. E. to S. N. to E.
NE. to SE. N. to E. NE. to SE. SE. to SW. NE. to SE. NW. to NE. NW. to NE.	NE. to SE. E. to S. Variable. S. to W. NE. to SE. NE. to SE. NE. to SE.	NE. to SE. S. to W. E. to S. NE. to SE. NW. to NE. NW. to NE.	S. to W. SE. to SW. NE. to SE. E. to S. N. to E. NE. to SE. E. to S.	NE. to SE. N. to E. NE. to SE. NW. to NE. NW. to NE. W.	SE. to SW. N. to E. NE. to SE. S. to W. NW. to NE. NE. to SE. W. to N.	E. to S. N. to E. NE. to SE. NW. to NE. NW. to NE. NE. to SE. E. to S.
NE. to SE. NE. to SE.	NE. to SE. E. to S.	NE. to SE. NE. to SE.	NW. to NE. NE. to SE.	N. to E. NE. to SE. NW. to NE.	NW. to NE. NE. to SE. NW. to NE.	N. to E. NE. to SE. NW. to NE.
NE. to SE. NE. to SE.	N. to E. E. to S.	N. to E. NE. to SE.	N. to E. E. to S.	N. to E. N. to E. NW. to NE.	N. to E.	N. to E. NW. to NE. NW. to NE.
No precipitation. NW. to NE. NW. to NE. NW. to NE.	No precipitation. NW. to NE. Variable. Variable.	No precipitation. Variable. Variable. NE. to SE.	SW. to NW. SW. to NW. NW. to NE.	N. to E. SW. to NW. N. to E.	N. to E. SW. to NW. N. to E.	S. to W. N. to E. NE. to SE. NW. to NE. N. to E.
NE. to SE. NW. to NE. NE. to SE. NE. to SE.	No precipitation. No precipitation. NE. to SE. No precipitation.	E. to S. No precipitation. NE. to SE. Variable.	Variable. No precipitation. Variable. Variable.	Variable. NE. to SE. NE. to SE. { N. to E. } { S. to W. }	Variable. W. to N. NW. to NE. NE. to SE.	NW. to NE. SW. to NW. NW. to NE. N. to E.

<sup>11</sup> Station closed September 30, 1882.

## APPENDIX 74.

Table showing the quadrants from which the winds most likely to be followed by rain or  
tricks of the

[Computed from observations taken during a period of

Geographical district.	January.	February.	March.	April.	May.
New England.....	SE. to SW.	SE. to SW.	E. to S.	SE. to SW.	SE. to SW.
Middle Atlantic States.....	N. to E.	E. to S.	E. to S.	E. to S.	SE. to SW.
South Atlantic States.....	N. to E.	NE. to SE.	SE. to SW.	SE. to SW.	NE. to SE.
Florida Peninsula.....	NE. to SE.	E. to S.	E. to S.	S. to W.	NE. to SE.
Eastern Gulf States.....	E. to S.	E. to S.	SE. to SW.	SE. to SW.	SE. to SW.
Western Gulf States.....	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Rio Grande Valley.....	E. to S.	E. to S.	NE. to SE.	NE. to SE.	NE. to SE.
Ohio Valley and Tennessee.....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
Lower lakes.....	SE. to SW.	SE. to SW.	SE. to SW.	S. to W.	S. to W.
Upper lakes.....	SE. to SW.	SE. to SW.	NE. to SE.	NE. to SE.	E. to S.
Upper Mississippi Valley.....	E. to S.	E. to S.	E. to S.	E. to S.	E. to S.
Missouri Valley.....	NW. to NE.	NW. to NE.	E. to S.	NE. to SE.	E. to S.
Extreme Northwest.....	E. to S.	E. to S.	NE. to SE.	NE. to SE.	E. to S.
Northern Slope.....	SW. to NW.	SW. to NW.	SW. to NW.	NW. to NE.	NW. to NE.
Middle Slope.....	NW. to NE.	N. to E.	N. to E.	N. to E.	N. to E.
Southern Slope.....	N. to E.	SE. to SW.	E. to S.	E. to S.	E. to S.
Southern Plateau.....	S. to W.	S. to W.	SE. to SW.	S. to W.	SE. to SW.
Middle Plateau.....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SW. to NW.
Northern Plateau.....	SE. to SW.	SE. to SW.	SW. to NW.	S. to W.	S. to W.
North Pacific Coast.....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	S. to W.
Middle Pacific Coast.....	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.	SE. to SW.
South Pacific Coast.....	E. to S.	S. to W.	S. to W.	S. to W.	SW. to NW.

## APPENDIX 75.

Table showing the quadrants from which the winds least likely to be followed by rain or  
tricks of the

[Computed from observations taken during a period of

Geographical district.	January.	February.	March.	April.	May.
New England.....	NE. to SE.	W. to N.	W. to N.	W. to N.	W. to N.
Middle Atlantic States.....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
South Atlantic States.....	E. to S.	W. to N.	W. to N.	W. to N.	W. to N.
Florida Peninsula.....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Eastern Gulf States.....	W. to N.	W. to N.	W. to N.	W. to N.	W. to N.
Western Gulf States.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.
Rio Grande Valley.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	W. to N.
Ohio Valley and Tennessee.....	W. to N.	W. to N.	W. to N.	W. to N.	NW. to NE.
Lower lakes.....	NW. to NE.	NW. to NE.	NW. to NE.	W. to N.	N. to E.
Upper lakes.....	N. to E.	NW. to NE.	W. to N.	W. to N.	W. to N.
Upper Mississippi Valley.....	W. to N.	SW. to NW.	W. to N.	W. to N.	W. to N.
Missouri Valley.....	SW. to NW.	S. to W.	S. to W.	SW. to NW.	SW. to NW.
Extreme Northwest.....	N. to E.	N. to E.	S. to W.	SW. to NW.	SW. to NW.
Northern Slope.....	E. to S.	E. to S.	E. to S.	S. to W.	S. to W.
Middle Slope.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Southern Slope.....	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.	SW. to NW.
Southern Plateau.....	NW. to NE.	N. to E.	NW. to NE.	N. to E.	NW. to NE.
Middle Plateau.....	N. to E.	N. to E.	N. to E.	N. to E.	N. to E.
Northern Plateau.....	NW. to NE.	NW. to NE.	NW. to NE.	NW. to NE.	NE. to SE.
North Pacific Coast.....	NW. to NE.	NW. to NE.	NE. to SE.	N. to E.	NE. to SE.
Middle Pacific Coast.....	N. to E.	N. to E.	NW. to NE.	N. to E.	N. to E.
South Pacific Coast.....	NW. to NE.	NW. to NE.	NW. to NE.	N. to E.	N. to E.

## APPENDIX 74.

snow are observed to blow during each month of the year, in the several geographical divisions of the United States.

from one to thirteen years—1871 to 1883, inclusive.]

June.		July.		August.		September.		October.		November.		December.	
SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
NE.	to SE.	NE.	to SE.	NE.	to SE.	NE.	to SE.	NE.	to SE.	NE.	to SE.	NE.	to SE.
SE.	to SW.	SE.	to SW.	E.	to S.	NE.	to SE.	E.	to S.	E.	to S.	E.	to S.
E.	to S.	E.	to S.	E.	to S.	E.	to S.	E.	to S.	E.	to S.	E.	to S.
E.	to S.	E.	to S.	NE.	to SE.	NE.	to SE.	NE.	to SE.	NW.	to NE.	N.	to E.
SE.	to SW.	S.	to W.	S.	to W.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
S.	to W.	S.	to W.	SE.	to SW.	S.	to W.	SE.	to SW.	SE.	to SW.	SE.	to SW.
SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	S.	to W.	SW.	to NW.
to S.	SE.	to S.	SE.	E.	to S.	SE.	to SW.	E.	to S.	E.	to S.	E.	to S.
E.	to S.	E.	to S.	E.	to S.	NE.	to SE.	E.	to S.	NW.	to NE.	NW.	to NE.
NE.	to SE.	SE.	to SW.	NE.	to SE.	NW.	to NE.	W.	to N.	SW.	to NW.	NW.	to NE.
N.	to E.	E.	to S.	E.	to S.	NW.	to NE.	N.	to E.	NW.	to NE.	NW.	to NE.
E.	to S.	E.	to S.	NE.	to SE.	NE.	to SE.	E.	to S.	N.	to E.	N.	to E.
SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	E.	to S.	S.	to W.
NW.	to NE.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.	S.	to W.	SE.	to SW.
SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
S.	to W.	SE.	to SW.	SE.	to SW.	SE.	to SW.	S.	to W.	SE.	to SW.	SE.	to SW.
SE.	to SW.	SE.	to SW.	S.	to W.	SE.	to SW.	SE.	to SW.	SE.	to SW.	SE.	to SW.
S.	to W.	S.	to W.	SW.	to NW.	SW.	to NW.	SW.	to NW.	S.	to W.	E.	to S.

## APPENDIX 75.

snow are observed to blow during each month of the year in the several geographical divisions of the United States.

from one to thirteen years—1871 to 1883, inclusive.]

June.		July.		August.		September.		October.		November.		December.	
W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.	SW.	to NW.
NW.	to NE.	N.	to E.	W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.
W.	to N.	N.	to E.	W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.
NW.	to NE.	NW.	to NE.	NW.	to NE.	W.	to N.	W.	to N.	SW.	to NW.	W.	to N.
W.	to N.	NW.	to NE.	NW.	to NE.	W.	to N.	SW.	to NW.	SW.	to NW.	SW.	to NW.
SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.
N.	to E.	N.	to E.	N.	to E.	W.	to N.	N.	to E.	N.	to E.	W.	to N.
NW.	to NE.	NW.	to NE.	N.	to E.	NW.	to NE.	NW.	to NE.	N.	to E.	NW.	to NE.
W.	to N.	W.	to N.	W.	to N.	W.	to N.	N.	to E.	N.	to E.	N.	to E.
NW.	to NE.	NW.	to NE.	SW.	to NW.	N.	to E.	W.	to N.	NW.	to NE.	SW.	to NW.
SW.	to NW.	SW.	to NW.	SW.	to NW.	S.	to W.	SW.	to NW.	S.	to W.	S.	to W.
N.	to E.	N.	to E.	SW.	to NW.	E.	to S.	E.	to S.	E.	to S.	E.	to S.
SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.	SW.	to NW.
W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.	W.	to N.
NW.	to NE.	N.	to E.	NW.	to NE.	NW.	to NE.	NW.	to NE.	NW.	to NE.	NW.	to NE.
S.	to W.	N.	to E.	N.	to E.	E.	to S.	N.	to E.	NW.	to NE.	N.	to E.
N.	to E.	N.	to E.	NE.	to SE.	E.	to S.	N.	to E.	W.	to N.	NW.	to NE.
NE.	to SE.	NE.	to SE.	NE.	to SE.	N.	to E.	N.	to E.	NW.	to NE.	NW.	to NE.
NW.	to NE.	NW.	to NE.	NW.	to NE.	NW.	to NE.	N.	to E.	N.	to E.	N.	to E.
E.	to S.	NW.	to NE.	E.	to S.	N.	to E.	NE.	to SE.	NW.	to NE.	NW.	to NE.

## APPENDIX 76.

*Meteorological summary for the year ending December 31, 1883.*

ALBANY, N. Y.

[Latitude, 42° 39' N.; longitude, 73° 49' W. Magnetic variation, 90 W. Elevation of barometer above sea-level, 75 feet. Elevation of exposed thermometer above ground, 51 feet. Elevation of rain-gauge above ground, 70 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.												
Month.	Washington time.			Monthly mean.			High.	Low.	Date.	Washington time.			Self-registering thermometers.		Washington time.			Washington time.			Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.				7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absol. range.	Mean maximum.	Mean minimum.	11 p. m.	3 p. m.	7 p. m.	Total.	Miles.	Miles.
1883.																										
Jan	30.122	30.099	30.118	30.113	30.573	42.3	44.1	21	1.131	20.7	26.1	23.1	22.3	346.0	31	Zero.	12.46	23.1	15.4	1.376	1.901	1.561	4,798	20	S.	13
Feb	30.154	30.141	30.167	30.154	30.696	24.2	25.0	7	1.192	25.3	32.5	28.4	28.7	47.0	17	9.6	24.57	25.1	20.8	1.376	1.900	1.629	4,905	22	W.	28
Mar	29.914	29.840	29.869	29.874	30.473	52.0	172	10	1.801	26.3	34.6	29.5	30.1	156.0	18	7.0	8.49	36.6	21.1	1.565	2,432	2,070	6,098	25	W., NW.	7
Apr	29.968	29.890	29.937	29.932	30.399	14.2	25.7	5	0.842	42.4	53.6	45.8	47.3	370.0	10	23.0	1.47	54.5	33.7	1.322	1,925	1,471	4,618	21	S., NW.	28
May	29.905	29.849	29.897	29.890	30.290	23.2	46.4	20	0.832	54.2	65.2	56.0	59.1	133.0	26	41.5	17.41	66.9	40.6	1.176	2,159	1,843	5,178	22	S.	19
June	29.915	29.853	29.896	29.885	30.413	23.2	80.8	11	1.045	69.0	78.0	69.0	72.0	98.0	10	52.3	1,235.7	79.7	63.2	1,031	1,890	1,456	4,897	22	N.	6
July	29.912	29.834	29.876	29.874	30.149	21.2	59.8	7	0.831	70.3	78.8	69.8	72.8	94.0	7	53.8	1,40.2	81.0	64.1	0.881	1,755	1,449	3,785	23	W.	2
Aug	29.904	29.914	29.961	29.953	30.290	15.2	67.3	25	0.607	65.4	77.0	67.3	69.3	87.5	22	49.3	26.38	78.1	61.6	0.824	1,461	1,111	3,236	23	W.	2
Sept	30.041	29.976	29.993	29.993	30.433	10.2	277	25	1.156	54.6	68.1	59.0	61.3	86.0	21	41.7	10.38	3.60	52.2	0.824	1,368	1,024	3,230	20	NW., W.	19
Oct	30.131	30.064	30.099	30.098	30.637	17.2	168	29	1.068	47.0	54.4	49.3	50.9	77.0	14	52.6	19.44	54.1	43.1	1,015	1,698	1,359	4,093	26	S.	35
Nov	30.061	30.007	30.031	30.033	30.453	16.2	494	9	0.969	40.4	48.2	43.8	44.0	67.5	22	25.0	29.45	50.7	37.8	1,368	1,914	1,464	4,754	23	NW.	29
Dec	30.039	29.997	30.015	30.017	30.708	29.2	260	27	1.448	37.8	53.9	51.4	51.0	65.0	8	—	28.63	57.4	35.6	1,068	1,814	1,361	4,773	26	NW.	12
Sums	360.146	350.444	366.538	366.516						347.3	651.9	571.9	590.8				576.4	469.9		14,058	22,318	17,518	53,894			
																	Averages.									
Means	30.012	29.955	29.966	29.965	30.708	29.20	172	110		48.6	54.3	47.7	49.2	394.0	37	—	56.4	40.6		171.51	151.65	111.68	5			1 July.
																										1 March.
																										• December.

• December.

† March.

‡ July.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.13 a. m., 3.13 p. m., and 11.13 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.080; February, 0.080; March, 0.080; April, 0.080; May, 0.080; June, 0.080; July, 0.080; August, 0.080; September, 0.080; October, 0.080; November, 0.080; December, 0.080.**

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.080; February, 0.080; March, 0.080; April, 0.080; May, 0.080; June, 0.080; July, 0.080; August, 0.080; September, 0.080; October, 0.080; November, 0.080; December, 0.080.**

**J. O. BARNES,**  
*Sergeant, Signal Corps, U. S. A.*





[illegible]

**Seven** 11 p. m. observations missed.

b Two 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.34 a. m., 2.34 p. m., and 10.34 p. m., local time.

Correction for instrumental error of barometer used: From 6.34 a. m., January 1, to 10.34 p. m., December 31, inclusive,  $\pm .003$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710, March, 0.700; April, 0.690; May, 0.680; June, 0.650; July, 0.610; August, 0.640; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

**JAMES J. FITZGERALD,**

*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

APACHE, FORT, ARIZ.

[Latitude, 88° 49' N.; longitude, 109° 57' W. Magnetic variation, 13° 30' E. Elevation of barometer above sea-level, 5,050 (B.) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.													
	Washington time.					Monthly mean.					Self-registering ther- mometers.					Washington time.			Washington time.			Maximum hourly velocity during month.								
	7 a. m.	3 p. m.	11 p. m.	In.	Out.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Month- ly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	3 p. m. to 7 a. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction	Date.		
1883.																						Miles.	Miles.	Miles.	Miles.	Miles.				
Jan	25.083	25.049	25.069	25.064	25.349	22.24	639	22.24	639	19	710	19.9	44.2	31.5	31.9	63.0	31	—	20	21	63.0	49.8	17.3	1,225	2,095	4,578	40	SW.	16	
Feb	25.045	25.006	25.034	25.028	25.399	17.21	631	17.21	631	15	748	28.9	50.7	38.2	39.3	63.0	20	27.0	17	80.0	64.7	25.0	1,906	1,702	2,375	36	NE.	17		
Mar	25.035	24.984	25.010	25.010	25.281	15.21	738	15.21	738	23	724	38.6	68.2	46.7	47.5	75.0	20	27.0	20	48.0	62.5	34.2	1,127	1,530	2,373	28	SW.	30		
Apr	24.939	24.912	24.931	24.924	25.329	13.21	605	13.21	605	20	724	32.8	63.0	48.2	48.0	78.0	18	15.0	14	63.0	68.3	30.0	1,285	2,947	3,473	7	SW.	20		
May	25.006	24.971	24.973	24.963	25.199	20.24	838	20.24	838	7	861	39.5	73.1	56.5	56.4	90.0	27	29.0	4	9.01	77.9	37.6	1,134	2,153	3,323	6	SE.	10		
June	25.045	25.007	24.998	25.017	25.156	30.24	830	30.24	830	8	878	49.2	85.5	72.3	69.0	101.0	25	27	38.0	2	15	63.0	1,224	1,388	2,330	4	SW.	15		
July	25.108	25.076	25.081	25.088	25.211	18.24	965	18.24	965	3	926	59.5	81.6	69.8	70.3	97.0	17	51.0	10	46.0	87.4	57.8	1,991	1,033	3,000	4	W.	12		
Aug	25.138	25.106	25.114	25.119	25.229	28.25	005	28.25	005	11	924	57.8	81.6	68.8	69.4	92.0	13	14	50.0	20	42.0	80.3	54.7	1,033	1,148	1,957	4	SW.	12	
Sept	25.112	25.087	25.074	25.084	25.245	6.24	866	6.24	866	13	979	48.4	80.6	62.5	63.6	96.0	1	23.7	30	56.0	84.6	47.3	840	1,407	2,016	4	SW.	16		
Oct	25.000	24.970	24.980	24.987	25.215	31.24	795	31.24	795	2	956	34.1	65.0	48.6	50.6	79.0	1	22.7	30	56.0	84.6	47.3	819	1,097	1,814	3	SW.	4		
Nov	25.031	25.022	25.051	25.045	25.294	8.24	795	8.24	795	19	989	26.5	58.2	38.6	41.1	72.0	1	16.0	26	56.0	61.9	23.5	819	1,097	1,814	3	SW.	4		
Dec	25.047	25.038	25.063	25.048	25.304	8.24	810	8.24	810	4	994	31.1	48.9	36.7	38.9	61.5	27	15.0	8	10	44.5	27.1	972	1,329	1,817	4	NE.	7		
Sums	300.609	300.203	300.878	300.397							468.3	791.5	618.4	638.2							846.1	441.2	12,324	18,308	28,322	58	854			
Means	25.051	25.017	25.032	25.033	25.399	17.24	605	17.24	605	230		38.0	68.0	51.5	52.2	101.0	425.27	—	6	20	21		70.5	36.8	1027.0	1925.7	2360.2			

Register unserviceable.      1 Register unserviceable.      2 February.      3 April.      4 June.      5 January.

R. Elevation determined by barometer.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.48 a. m., 12.48 m., and 8.48 p. m., local time. Correction for instrumental error of barometer used: From 4.48 a. m., January 1, to 8.48 p. m., December 31, inclusive,  $\pm .008$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 5.12; February, 5.10; March, 5.02; April, 4.92; May, 4.82; June, 4.75; July, 4.74; August, 4.72; September, 4.80; October, 4.90; November, 5.10; December, 5.08.**

**JOHN B. TURTON,**  
*Private, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

ASSINABOINE, FORT, MONT.

[Latitude, 49° 22' N.; longitude, 109° 42' W. Magnetic variation, 20° 30' E. Elevation of barometer above sea-level, 2,710 (B.) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.														
Month.	Washington time.			Monthly mean.			Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.				Miles.	Direction from—	Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.					Date.	Maximum.	Minimum.	Date.	Absolute range.	11 p. m. to 7 a. m.			7 a. m. to 3 p. m.	3 p. m. to 11 a. m.	Total.									
1883.																														
Jan .....	27.168	27.197	27.190	27.185	27.729	18.26	609	11	1.120	.907	4.8	3.0	7.3	4.5	4.9	41	8	43	19	84	2	5.5	2.774	2.967	2.475	8,216	52	SW.	8	
Feb .....	27.289	27.293	27.280	27.287	27.712	1.26	805	10	.907		4.8	13.3	10.4	9.5	41	22	47	3	88	18	7	1.5	3.005	2.918	9,049	40	SW.	4		
Mar .....	27.242	27.212	27.242	27.232	27.688	2.26	613	17	1.075		23.4	33.1	28.7	28.4	58	17	6	27	52	37.8	19.8		2.304	2.552	2.467	3,723	54	W.	17	
Apr .....	27.072	27.058	27.058	27.063	27.687	24.26	513	20	1.174		32.9	50.0	42.0	41.6	70	28	16	4	54	52.5	31.5		3.130	2.634	2.767	7,581	48	W.	15	
May .....	27.160	27.134	27.137	27.144	27.441	10.26	728	17	.713		40.3	57.7	50.5	49.5	75	20	21	2	64	61.2	39.0		2.238	2.636	2.318	8,092	52	W.	31	
June .....	27.137	27.121	27.096	27.118	27.423	8.26	877	10	.546		52.2	71.6	64.3	62.7	101	29	31	1	70	75.3	50.6		2.217	2.628	2.976	7,821	44	W.	2	
July .....	27.210	27.180	27.177	27.189	27.448	26.36	857	13	.591		53.7	77.9	66.9	66.2	93	9	42	16	51	81.3	52.1		2.109	2.477	3.425	8,011	52	SW.	1	
Aug .....	27.209	27.192	27.191	27.197	27.388	27.26	861	20	.527		56.1	76.0	65.8	66.0	90	28	38	22	52	79.6	54.3		2.296	2.652	2.724	7,642	42	SW.	16	
Sept .....	27.282	27.255	27.242	27.260	27.822	18.84	938	18	.884		43.9	65.1	53.6	54.2	83	18	28	30	55	67.9	42.2		1.972	2.516	2.649	6,213	34	W.	14	
Oct .....	27.131	27.132	27.132	27.132	27.557	10.26	562	27	.905		33.4	45.1	38.2	38.9	62	5	22	24	31	40	47.7		1.870	2.056	2.545	7,033	44	W.	29	
Nov .....	27.111	27.091	27.115	27.106	27.704	13.26	611	20	1.153		21.6	31.6	25.2	26.1	62	1	23	25	85	37.0	15.4		2.976	3.054	3.166	9,196	50	SW.	29	
Dec .....	27.150	27.189	27.179	27.173	27.767	14.26	442	25	1.325		20.9	25.1	21.0	22.3	51	10, 11	17	30	68	31.0	14.0		2.973	3.118	2.634	8,725	48	SW.	27	
Sums.	326.161	326.054	326.036	326.036	326.036	.....	.....	.....	.....	.....	386.2	553.8	471.1	470.3	.....	604.2	234.0	32.345	33.664	94.903	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Means	27.180	27.171	27.170	27.174	27.822	20.26	442	+25	.....	.....	32.2	46.2	39.3	39.2	101	+29	—47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

§ February.

† June.

B.—Elevation determined by barometer.

† December.

\* September.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—								Remarks.																																																																																																																													
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																														
											7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.																																																																																																																																					
1883.																																																																																																																																																								
Jan.....	6	19	3	0	3	34	14	6	8	2.47	In.	6	6.5	5.6	6.2	5.9	5.0	63.3	64.0	63.3	3	17	11	12	25	29	0																																																																																																																													
Feb.....	1	10	0	0	3	59	6	4	1	1.72	La.	5	3.8	3.0	3.4	2.4	2.4	59.7	59.7	60.0	15	9	4	6	21	28	0																																																																																																																													
Mar.....	2	25	10	2	6	29	11	4	4	1.61	In.	24	5.1	5.6	5.6	15.3	22.5	60.6	60.6	68.5	10	9	12	9	27	0																																																																																																																														
Apr.....	3	11	18	9	11	24	12	6	3	1.43	In.	20	4.1	4.5	4.1	24.5	25.7	42.5	42.5	58.0	19	16	5	3	12	0																																																																																																																														
May.....	3	11	18	9	14	21	8	8	1	1.65	In.	24	5.7	5.0	5.2	31.4	34.4	50.5	50.5	58.5	6	14	11	7	0	0																																																																																																																														
June.....	10	3	4	5	18	25	14	10	1	1.77	In.	20	3.9	3.4	3.7	40.6	42.7	39.7	39.7	53.1	15	8	7	6	0	0																																																																																																																														
July.....	11	4	12	1	15	21	23	6	0	2.24	In.	15	2.8	2.3	2.3	39.5	43.1	31.8	31.8	46.3	15	14	2	3	0	0																																																																																																																														
Aug.....	6	11	15	3	11	25	10	11	1	2.59	In.	10	3.7	2.3	2.3	44.1	45.1	50.3	50.3	51.0	18	13	2	3	0	0																																																																																																																														
Sept.....	6	16	12	4	19	22	7	8	1	1.65	In.	1	2.6	2.3	2.3	37.3	37.5	38.9	38.9	54.4	16	13	1	8	0	0																																																																																																																														
Oct.....	5	12	19	2	14	27	11	11	3	1.98	In.	18	5.6	5.0	5.0	25.9	28.3	57.3	57.3	63.9	10	12	9	11	0	16	0																																																																																																																													
Nov.....	4	8	1	3	2	56	5	17	0	3.76	In.	24	5.6	5.4	5.9	17.6	15.1	70.8	59.3	63.6	5	16	0	11	8	25	0																																																																																																																													
Dec.....	7	16	4	0	0	55	2	2	2	2.23	In.	21	3.9	3.4	4.1	11.9	14.3	64.8	67.6	67.0	13	13	5	9	12	25	0																																																																																																																													
Sums..	63	153	97	34	116	392	123	93	24	15.10		52	252	949	751	4269	5307	5723	5723	7714.5	133	154	78	90	78	171	10																																																																																																																													
Mean..	Percentages.																			Percentages.																																																																																																																																				
	5.3																			14.0																			9.3																			11.0																			6.35																			8.11																			28.5																			2																		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.49 a. m., 12.49 p. m., and 8.49 p. m. local time. Correction for instrumental error of barometer used: From 4.49 a. m., January 1, to 8.49 p. m., December 31, inclusive, +.013 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.04; February, 3.04; March, 3.01; April, 2.90; May, 2.84; June, 2.79; July, 2.73; August, 2.75; September, 2.85; October, 2.82; November, 2.83; December, 3.08.

F. NEWMAN  
*Private, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

ATLANTA, GA.

[Latitude, 33° 45' N.; longitude, 84° 22' W. Magnetic variation, 4° 19' E. Elevation of barometer above sea-level, 1,120 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 76 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.										
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.			Date.	Absolute range.	7 a. m. to		3 p. m. to	11 p. m. to	Total.	Miles.
1883.																								
Jan.	28.106	28.962	28.997	28.867	28.437	22.28	515	9	.922	38.4	44.5	42.2	42.4	43.8	28.14	12.49	2.230	2.368	2.179	6.777	34	W.	20	
Feb.	28.071	28.071	28.101	28.068	28.444	27.28	861	17	.563	43.1	55.1	49.2	49.8	74.5	16.28	27.48	1.900	2.006	2.076	6.036	30	N.E.	24	
Mar.	28.902	28.840	28.875	28.872	28.300	1.28	512	19	.788	43.0	56.8	49.1	49.6	75.0	16.48	27.48	2.401	2.836	2.483	7.720	32	W.	10	
Apr.	28.865	28.823	28.845	28.844	28.143	3.28	455	28	.688	55.6	67.9	60.0	61.2	83.0	13.83	3.43	1.438	1.547	1.401	4.406	26	S.W.	6	
May	28.900	28.843	28.871	28.872	28.123	25.28	456	20	.696	61.5	74.6	64.9	67.0	84.0	8.939	22.44	1.890	1.976	2.095	5.831	32	W.	15	
June	28.908	28.864	28.888	28.867	28.106	2.28	695	25	.411	71.5	82.2	74.0	75.9	90.6	18.55	12.4	1.456	1.737	1.707	4.890	33	W.	12	
July	28.978	28.919	28.948	28.946	28.218	22.28	775	13	.443	74.4	87.1	77.9	79.8	95.0	17.63	10.31	1.456	1.698	1.805	4.925	24	N.W.	28	
Aug.	28.933	28.885	28.916	28.911	28.066	31.28	735	29	.831	69.7	82.5	73.1	75.1	101.2	16.0	31.81	1.091	1.215	1.379	3.785	26	N.W.	1	
Sept.	28.938	28.884	28.913	28.912	28.119	27.28	714	21	.406	64.3	76.3	70.1	70.8	90.0	14.44	25.28	1.562	1.425	1.559	4.546	28	N.E.	10	
Oct.	28.974	28.920	28.962	28.962	28.222	16.28	811	29	.611	59.3	72.3	64.2	65.3	89.0	14.44	29.42	2.129	2.021	1.888	6.038	28	N.W.	29	
Nov.	28.058	28.005	28.039	28.034	28.861	17.28	821	9	.530	47.7	60.3	52.8	53.6	76.5	10.20	16.55	2.346	2.278	2.092	6.716	32	N.	16	
Dec.	28.991	28.965	28.986	28.984	28.195	10.28	696	27	.559	42.7	54.6	48.6	48.0	65.0	9.30	16.43	2.478	2.461	2.344	7.188	33	W.	27	
Sums	347.549	344.968	347.848	347.394	347.394	272.28	515	9	678.2	818.0	724.8	788.5	788.5	848.1	389.2	348.1	22,837	25,717	22,908	68,962	.....	.....	.....	
Means	28.902	28.915	28.946	28.941	28.444	27.28	455	128	56.1	68.2	60.4	61.5	65.0	74.2	17.14	70.7	1,861.4	1,973.4	1,908.0	.....	.....	.....	.....	

February.                      April.                      July.                      January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—					Remarks.						
	Number of calms.								Total amount.	Any 8 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.		Minimum below 32°.	Maximum above 32°.				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.	
1883.																																
Jan.....	2	5	18	14	2	6	16	28	215	834.03	6	5.9	5.4	5.2	5.5	34.1	35.7	35.7	35.2	84.8	69.7	72.9	77.8	8	11	12	17	0	11	0		
Feb.....	2	10	16	9	4	5	6	31	1	3,330.68	17,18	5.1	7.0	4.2	5.4	40.4	43.1	41.8	41.6	84.6	69.1	77.0	76.9	8	12	8	17	0	2	0		
Mar.....	6	3	3	0	3	20	28	28	2	3,731.53	30,31	4.5	4.6	3.9	4.3	35.0	36.3	33.2	35.5	74.2	50.8	67.4	64.1	14	9	8	12	0	2	0		
Apr.....	3	4	10	14	8	12	5	25	9	8,203.08	9	5.4	5.5	3.6	4.8	49.3	50.1	49.6	49.7	80.0	54.3	70.8	69.0	8	15	7	12	0	0	0		
May.....	8	2	4	13	18	10	21	16	1	2,000.99	1	3.8	3.8	2.8	3.4	53.8	52.8	53.1	53.2	76.6	48.5	67.1	64.2	17	10	4	8	0	0	0		
June.....	3	3	13	7	11	21	6	18	8	2,310.82	7,8	6.0	5.2	2.3	4.5	65.8	63.8	66.0	65.2	82.7	55.8	77.0	71.8	7	18	5	12	0	0	0		
July.....	9	4	10	10	5	5	30	15	5	1,060.46	24	2.0	4.7	1.8	1.8	65.2	62.2	64.1	63.8	73.3	45.5	63.9	60.9	19	10	2	7	0	0	13		
Aug.....	14	7	17	9	0	5	8	20	18	2,730.80	15,16	3.0	4.7	2.6	3.4	64.6	63.6	64.2	63.8	84.2	52.5	74.6	70.4	14	15	2	12	0	0	0		
Sept.....	9	8	16	9	4	4	17	18	5	1,380.42	23,24	3.8	4.4	3.0	3.7	58.4	57.1	59.5	58.3	80.8	51.5	71.0	67.8	14	10	6	10	0	0	0		
Oct.....	5	9	28	13	4	8	8	16	2	1,521.06	22	4.1	4.6	3.2	4.0	55.9	55.7	55.3	55.6	89.1	58.7	75.1	74.8	13	12	6	8	0	0	0		
Nov.....	4	18	11	17	7	9	16	0	4	4,732.10	23,23	4.0	4.4	2.2	3.5	38.7	40.4	40.7	39.9	72.7	52.9	66.7	64.1	15	11	4	9	0	0	4		
Dec.....	7	2	10	19	6	7	7	35	0	4,841.27	0	3.8	4.4	4.2	4.2	38.4	37.3	38.9	38.9	58.9	54.9	70.8	68.7	13	12	6	14	0	5	0		
Sums ..	76	61	163	128	82	110	161	266	48	51,53	.....	51.4	53.7	39.9	49.9	55.97	55.97	56.04	55.97	1,067.9	860.3	830.0	830.0	150	145	70	138	0	24	18		
Percentages.																																
Means ..	6.9	5.6	6.14	9.11	7.7	6.10	7.4	7.94	3.4	.....	.....	4.8	4.9	3.2	4.1	49.8	49.8	50.4	50.0	80.2	55.7	71.7	69.2	41.1	38.7	19	287	8	.....	6.64		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.31 a. m., 2.31 p. m., and 10.31 p. m., local time. Correction for instrumental error of barometer used: From 6.31 a. m., January 1, to 10.31 p. m., December 31, inclusive, +.005 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.230; February, 1.220; March, 1.210; April, 1.190; May, 1.170; June, 1.150; July, 1.150; August, 1.150; September, 1.170; October, 1.190; November, 1.220; December, 1.230.

S. W. BEALL,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

ATLANTIC CITY, N. J.

[Latitude, 39° 29' N.; longitude, 74° 25' W. Magnetic variation, 8° W. Elevation of barometer above sea-level, 19 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 37 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.														
	Washington time.			Monthly mean.			Washington time.				Self-registering ther- mometers.				Washington time.				Maximum hourly velocity during month.												
	7 a. m.	8 p. m.	11 p. m.	I <sub>h</sub> .	I <sub>m</sub> .	I <sub>v</sub> .	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Ab- solute.	Mean maximum.	Mean minimum.	Washington time.				Miles.	Direction	Date.			
																						7 a. m. to	8 p. m. to	11 p. m. to	7 a. m. to				8 p. m. to	11 p. m. to	
1883.																															
Jan.....	30.177	30.135	30.159	30.157	30.052	24.29.434	24.29.434	10	1.198	28.0	33.2	33.2	33.2	30.244	0.21.31	5.2	12.40.8	38.0	22.8	0	0	0	0	2.578	2.626	2.338	7.242	87	N.	10	
Feb.....	30.235	30.224	30.252	30.244	30.172	23.29.707	23.29.707	7	1.065	32.4	38.5	38.4	38.4	36.1	0.14.0	17	17.0	27.47.0	42.2	28.2	0	0	0	2.057	2.323	1.974	6.293	26	N.	12	
Mar.....	30.268	30.207	30.236	30.250	30.165	8.29.136	8.29.136	10	1.349	31.5	39.9	39.5	39.5	35.0	0.01.0	15	11.0	8.00.0	42.5	28.5	0	0	0	2.346	3.088	2.615	8.049	82	N.W.	7	
Apr.....	30.298	30.262	30.294	30.285	30.130	14.29.573	14.29.573	23	857	44.2	48.2	44.1	45.5	0.03.0	6	27.0	1.38.0	51.8	39.4	0	0	0	2.082	2.818	2.466	7.366	95	N.E.	20		
May.....	30.273	30.225	30.247	30.243	30.134	13.29.430	13.29.430	21	884	54.8	60.5	54.8	54.7	0.27.0	29	40.0	1.98.4	63.4	50.0	0	0	0	2.347	2.769	2.661	7.777	28	S.	23		
June.....	30.294	30.232	30.263	30.253	30.133	12.29.625	12.29.625	11	835	65.9	70.9	65.8	70.9	0.54.0	20	52.0	2.62.0	73.8	60.9	0	0	0	1.624	2.092	2.051	5.767	25	S.E.	26		
July.....	30.292	30.232	30.262	30.253	30.133	11.29.625	11.29.625	24	514	70.8	78.3	69.8	78.3	0.04.0	23	57.0	1.97.0	68.0	65.6	0	0	0	1.635	2.240	2.094	5.969	27	S.E.	28		
Aug.....	30.030	30.097	30.078	30.018	30.239	15.29.651	15.29.651	2	568	68.0	75.1	68.5	75.1	0.59.0	21	55.0	3.198.0	76.6	68.3	0	0	0	1.092	2.636	1.945	6.273	27	N.E.	8		
Sept.....	30.077	30.028	30.040	30.040	30.391	16.29.562	16.29.562	24	829	62.0	69.4	63.9	69.4	0.18.0	30	45.0	10.95.0	71.1	57.9	0	0	0	2.152	2.727	2.651	7.430	29	S.	29		
Oct.....	30.155	30.099	30.137	30.130	30.597	17.29.422	17.29.422	29	1.175	53.2	59.5	54.0	59.5	0.17.0	3	39.8	2.96.5	60.9	48.2	0	0	0	2.215	2.658	2.510	7.083	30	N.E.	12		
Nov.....	30.171	30.115	30.139	30.143	30.636	17.29.711	17.29.711	11	925	43.0	50.2	44.6	50.2	0.43.0	4	18.7	17.44.8	52.8	39.4	0	0	0	1.984	2.854	1.881	6.060	37	N.W.	13		
Dec.....	30.115	30.068	30.101	30.090	30.617	22.29.468	22.29.468	27	1.129	34.4	40.7	36.5	40.7	0.07.0	5	11.0	23.45.6	43.4	28.8	0	0	0	1.631	2.043	1.716	5.390	29	N.W.	28		
Sums.....	360.923	360.371	360.697	360.695	360.695	.....	.....	.....	.....	588.2	664.4	598.1	617.0	.....	.....	.....	.....	698.7	631.6	24.043	82.374	26.352	80.769	.....	.....	.....	.....	.....	.....	.....	
Means.....	30.077	30.031	30.068	30.065	30.772	*23.29.136	*23.29.136	110	.....	49.0	55.4	48.0	51.4	94	123	5.2	51.3	.....	57.8	44.3	2,003.6	2,097.8	2,193.0	Averages.	.....	.....	.....	.....	.....	.....	.....
* February.																															
† July.																															
‡ March.																															
§ January.																															

\* February.

† March.

‡ July.

§ January.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

AUGUSTA, GA.

[Latitude, 33° 28' N.; longitude, 81° 54' W. Magnetic variation, 22 30'. Elevation of barometer above sea-level, 183 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																										
	Washington time.			Monthly mean.			Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Total.	Miles.	Direction from—	Date.																				
	7 p. m.	3 p. m.	11 p. m.	7 p. m.	3 p. m.	11 p. m.					Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 p. m.	7 p. m. to 3 p. m.					3 p. m. to 11 p. m.																			
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.																			
1881.																																											
Jan.	30.039	29.987	30.036	30.021	30.492	23.29.428	9	1.064	0	0	28 19.6	12 50.4	57.7	39.9	484	832	730	2,046	24	SW.	9																						
Feb.	30.140	30.090	30.126	30.119	30.444	27.29.855	7	.569	0	0	17 34.3	29 47.7	65.6	47.8	419	975	722	2,068	22	N.	18																						
Mar.	29.920	29.839	29.882	29.880	30.315	1.29.474	31	.841	53.8	70.0	29 32.3	17 46.7	65.0	42.4	464	1,250	933	2,647	23	SW.	10																						
Apr.	29.872	29.822	29.855	29.850	30.160	4.29.419	23	.741	64.5	87.0	13 41.7	3 45.3	74.4	55.1	741	1,074	881	3,062	30	N.	17																						
May.	29.830	29.819	29.832	29.833	30.091	18.29.400	20	.681	63.4	79.7	15 43.0	23 48.0	81.6	50.9	563	1,237	981	2,801	24	N.E.	1																						
June.	29.838	29.819	29.860	29.856	30.107	4.29.641	26	.466	73.7	87.0	19 04.3	3 30.7	88.8	70.4	422	1,133	992	2,547	18	N.E.	14																						
July.	29.930	29.859	29.902	29.897	30.174	22.29.673	13	.501	77.5	91.8	17 11.7	1 28.3	88.0	74.8	337	1,188	1,058	2,583	25	N.W.	28																						
Aug.	29.894	29.834	29.877	29.868	30.039	31.29.648	29	.891	74.1	87.7	21 63.0	8 33.0	98.0	71.8	895	1,131	803	2,329	21	N.E.	8																						
Sept.	29.912	29.841	29.889	29.881	30.109	27.29.679	11	.430	67.3	82.0	4 55.5	27 39.0	83.5	65.5	579	1,197	981	2,757	21	N.	10																						
Oct.	29.979	29.906	29.958	29.948	30.272	17.29.609	29	.663	62.0	76.3	68.2	31 43.0	77.8	60.6	771	1,455	1,162	3,388	18	N.N.E.	12																						
Nov.	30.066	30.013	30.060	30.053	30.455	16.29.805	14	.550	50.9	66.4	54.9	17 54.5	67.0	48.6	826	1,175	669	2,976	20	N.	29																						
Dec.	30.028	29.970	30.023	30.007	30.214	10.29.666	14	.546	46.1	62.3	51.2	16 45.2	63.1	44.0	826	1,819	578	1,723	22	W.	27																						
Sums.	359.878	353.799	359.320	359.223					713.7	888.6	766.0	789.6			6,053	13,679	10,613	30,345																									
Means.	29.965	29.900	29.943	29.936	30.492	12.29.400	20		59.5	74.0	63.8	65.8	100.0	56.7	504.4	1,189.9	884.4																										
																							Averages.																				
																							906.0	890.8																			
																							13,679	10,613	30,345																		
																							504.4	1,189.9	884.4																		
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																							74.0																				
																							888.6																				
																							766.0																				
																							789.6																				

\* One 7 a. m. observation missed.

† January.

‡ May.

§ July.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Cloudiness (in tenths).			Dew-point.			Relative humidity . (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
1883.										<i>fa.</i>	<i>in.</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			</

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

Correction for instrumental error of barometer used: From 6.41 a. m., January 1, to 10.41 p. m., December 31, inclusive, —.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.200; February, 0.200; March, 0.200; April, 0.190; May, 0.190; June, 0.190; July, 0.190; August, 0.190; September, 0.190; October, 0.190; November, 0.200; December, 0.200.

LOUIS DUANE,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BALTIMORE, MD.

[Latitude, 39° 19' N.; longitude, 76° 37' W. Magnetic variation, 8° 39' W. Elevation of barometer above sea-level, 48 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 66 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).						Temperature.						Wind.					
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Washington time.			Washington time.		
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Date.	11 a. m. to 7 p. m.	7 p. m. to 11 p. m.	4 p. m. to 7 p. m.	3 p. m. to 4 p. m.	11 p. m. to 3 p. m.	Total.	Maximum hourly velocity during month.
	In.	In.	In.															
1883.																		
Jan .....	30.189	30.161	30.181	30.174	30.018	24 22.576	10 1.042										22	NW.
Feb .....	30.269	30.238	30.256	30.255	30.767	2 30.680	7 1.077										22	NW.
Mar .....	30.016	29.923	29.983	29.974	30.525	8 20.330	10 1.195										28	NW.
Apr .....	30.017	29.933	30.005	29.992	30.414	14 22.567	23 .817										28	NW.
May .....	30.079	30.010	30.043	30.044	30.316	1 23.328	21 .868										28	NW.
June .....	30.070	30.021	30.051	30.047	30.441	2 23.639	11 .869										28	NW.
July .....	30.069	30.035	30.065	30.061	30.180	21 23.052	24 .867										28	NW.
Aug .....	30.030	29.981	30.016	30.009	30.248	15 23.633	2 .860										28	NW.
Sept .....	30.071	30.009	30.033	30.038	30.416	10 22.530	24 .880										28	NW.
Oct .....	30.167	30.103	30.143	30.136	30.605	16 23.477	29 1.123										28	NW.
Nov .....	30.188	30.120	30.147	30.139	30.638	17 23.734	9 .904										28	NW.
Dec .....	30.120	30.077	30.115	30.104	30.008	23 23.516	27 1.092										28	NW.
Sums .....	361.006	360.320	360.780	360.688													360	
Means .....	30.084	30.037	30.061	30.057	30.767													

\* February.

† May.

‡ July.

§ January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7.02 a. m., 3.02 p. m., and 11.02 p. m. local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.02 p. m., December 31, inclusive, +.025 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

GEO. W. FELGER,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883.—Continued.*

BARNEGAT CITY, N. J.

[Latitude, 39° 48' N.; longitude, 74° 0' W. Magnetic variation, 6° W. Elevation of barometer above sea-level, 33 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.										
	Washington time.					Highest.	Lowest.	Date.	Range.	Washington time.					Self-registering thermometers.					Washington time.					Total.	Miles.	Direction from—	Maximum hourly velocity during month.			
	Washington time.			Monthly mean.	Washington time.					Monthly mean.	Self-registering thermometers.			Monthly mean.	Washington time.			Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.					Mean minimum.		
	7 p. m.	3 p. m.	11 p. m.		7 p. m.						3 p. m.	11 p. m.	7 p. m.		3 p. m.	11 p. m.	7 p. m.													3 p. m.	11 p. m.
1882.	Jan.	30.138	30.130	30.151	30.154	30.623	24.28	41.0	10	1.213	28.8	33.3	30.3	30.3	30.848	0	81	6	4	24	41.6	38.4	24.3	3.904	4.180	3.871	11.706	53	N.E.	10	
Feb.	30.253	30.228	30.250	30.244	30.784	23.62	42.4	7	1.100	32.4	38.6	34.7	34.7	30.260	0	17	17	0	2	48.0	41.7	28.5	2.361	3.751	3.751	7.880	10	N.W.	12		
Mar.	30.349	30.303	30.301	30.353	30.471	18.28	42.4	10	1.843	32.7	40.4	34.9	34.9	30.032	0	15	12	0	1	50.6	41.7	28.5	2.331	4.595	4.044	12.413	46	N.W.	20		
Apr.	30.428	30.397	30.397	30.469	30.444	14.23	43.9	23	0.946	41.5	47.9	44.8	44.8	28.061	0	12	20	3	0	29.3	51.3	40.9	3.177	3.871	3.871	10.690	40	N.	22		
May.	30.508	30.481	30.480	30.570	30.558	11.20	43.9	21	0.920	45.2	50.3	48.0	48.0	26.875	0	28	40	2	1	24.8	51.3	40.9	3.177	3.871	3.871	10.690	42	N.	16		
June.	30.583	30.552	30.557	30.673	30.477	8.23	43.9	11	0.885	47.8	50.8	48.0	48.0	23.595	0	21	54	3	1	20.7	71.5	61.3	2.601	3.105	3.232	8.838	39	N.	11		
July.	30.658	30.600	30.604	30.710	30.248	21.28	43.9	2	0.900	62.2	75.9	68.8	68.8	72.991	0	33	59	1	1	31.5	79.4	64.3	2.658	3.214	3.473	8.473	36	N.	8		
Aug.	30.712	30.681	30.682	30.743	30.596	10.28	42.4	24	0.872	62.5	67.8	63.0	63.0	70.486	0	21	48	0	31	28.0	75.4	64.6	3.058	3.779	3.193	10.046	40	N.	2		
Sept.	30.774	30.701	30.702	30.743	30.596	17.28	42.4	29	1.190	53.7	58.2	54.8	54.8	60.744	0.5	48	0	2	29.0	68.8	59.0	3.511	3.883	3.193	11.186	49	N.	24			
Oct.	30.815	30.784	30.784	30.815	30.615	17.28	42.4	29	1.190	53.7	58.2	54.8	54.8	60.744	0	2	46	3	25	33.7	80.0	50.1	3.764	3.944	3.598	11.804	56	N.E.	28		
Nov.	30.868	30.837	30.837	30.868	30.668	23.28	46.5	27	1.001	43.6	50.2	45.0	45.0	46.368	0	22	24	0	17	39.0	83.4	40.8	3.558	4.067	3.558	11.181	66	N.W.	13		
Dec.	30.910	30.865	30.865	30.904	30.697	23.28	46.5	27	1.173	34.9	40.2	38.6	38.6	37.857	0	8	11	0	23	46.0	44.3	30.9	3.461	3.919	3.479	10.859	59	N.W.	28		
Sum.	300.873	300.851	300.850	300.844						599.1	685.7	611.9	618.9								600.7	545.2	40.543	45.909	42.487	128.889					
Means.	30.078	30.082	30.087	30.054	30.764	*2.26	128	110		49.9	54.6	50.2	51.0	50.1	0					6.4	594	57.6	45.4	4.378	5.053	4.883	55.540	6			
											March.					July.					January.					Averages.					

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.		Washington time.						Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
											Largest amount.	Rate.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.		7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.13 a. m., 3.12, and 11.12 p. m., local time.

Correction for instrumental error of barometer used: From 7.12 p. m., January 1, to 1.12 p. m., December 31, inclusive, +.011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

GEO. A. HILL,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BENNETT, FORT, D.A.K.

[Latitude, 44° 48' N.; longitude, 100° 29' W. Magnetic variation 19° 19' E. Elevation of barometer above sea-level, 1,510 (B.) feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 18 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.					Range.	Washington time.					Self-registering thermometers.					Washington time.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 p. m.	8 p. m.	11 p. m.	In.	Th.	In.	Th.	In.	Th.	In.		Th.	Date.	Lowest.	Date.	Monthly mean.			Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	8 p. m.	11 p. m.	Total.	Miles.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

\* December.

† May.

B.—Elevation determined from barometer.

‡ July.

§ January.

Month.	Winds at 7 a. m., 9 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—						Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Any 8 consecutive 8 hourly measure ments.		Total amount.	Clearness (in fathoms).				Dew-point.				Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.
											Date.	Largest amount.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.								
1883.																																	
Jan.	4	7	1	19	0	1	0	25	26	0.37	0.12	18	5.5	6.2	4.0	5.2	—	6.4	2.0	—	0.8	7	18	6	9	23	31	0	0	0			
Feb.	8	5	0	11	2	5	0	25	28	0.40	0.13	12	4.2	5.0	3.9	4.7	17.9	4.2	15.0	0.0	20.7	12	8	8	18	28	0	0	0				
Mar.	4	18	2	20	2	1	24	21	29	0.64	0.19	27	6.2	5.9	5.9	6.4	32.3	32.8	32.0	32.3	32.3	17	13	7	13	30	0	0	0				
Apr.	6	23	3	18	3	2	13	21	23	0.28	0.20	21	6.8	5.9	6.1	6.9	40.7	41.6	43.6	43.0	43.0	4	15	11	7	0	0	0	0				
May	10	17	8	26	3	2	18	9	23	0.25	0.23	13	6.8	7.9	6.1	6.9	53.2	54.4	55.0	54.4	53.2	3	13	15	7	0	0	0	0				
June	6	8	1	21	4	6	8	15	17	0.39	0.39	17	4.7	5.9	4.8	5.2	53.2	54.4	55.0	54.4	53.2	8	17	5	9	0	0	0	0				
July	5	14	1	35	2	6	22	0	23	0.79	0.79	23	5.7	5.8	4.0	5.2	55.0	56.8	56.8	56.8	56.8	12	15	4	9	0	0	0	0				
Aug.	8	11	2	37	5	6	23	2	21	0.80	0.80	31	4.7	5.8	3.8	5.2	55.0	56.8	56.8	56.8	56.8	12	15	8	4	0	0	0	0				
Sept.	6	10	2	34	5	1	25	4	21	0.80	0.17	21	5.0	4.5	1.7	3.7	41.5	44.9	48.2	43.2	43.2	12	15	11	8	0	0	0	0				
Oct.	4	13	2	34	1	4	21	28	7	1.19	0.87	16	17	5.5	5.6	6.5	56.8	58.2	58.2	58.2	58.2	4	16	11	8	0	0	0	0				
Nov.	3	7	1	18	0	2	0	26	24	1.19	0.87	16	17	5.5	5.6	6.5	56.8	58.2	58.2	58.2	58.2	14	14	2	0	8	30	0	0				
Dec.	3	15	2	12	0	2	0	26	24	1.18	0.85	6	4.8	6.4	4.8	5.3	9.1	15.2	12.9	12.9	12.9	8	16	7	11	12	81	0	0				
Sums ..	56	147	25	285	24	46	26	286	190	16.91	.....	63	87.1	5.51	8.62	8	348.4	308.5	398.8	378.0	398.8	96	176	96	58	177	21						
																				Percentages.													
Means	5.1	12.4	2.3	24.2	2.4	2.2	4.3	25.1	17.3	.....	.....	5.3	6.0	4.3	5.2	.....	22.0	22.0	32.4	31.5	32.3	73.0	68.4	73.7	115.9	43.5	5.3	.....	.....	.....			

\* Inappreciable.

North—7 a. m., 3 p. m., and 11 p. m., Washington time, corresponds with 5.26 a. m., 1.26 p. m., and 9.26 p. m., local time. Corrections for instrumental errors of barometer used: From 5.26 a. m., January 1, to 9.26 p. m., January 31, inclusive, +.023 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.740; February, 1.780; March, 1.700; April, 1.640; May, 1.580; June, 1.540; July, 1.540; August, 1.540; September, 1.500; October, 1.620; November, 1.600; December, 1.700.

A. PRITCHARD  
Sergeant, Signal Corps, U. S. A.

**APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.***

**BENTON, FORT, MONT.**

Latitude, 47° 55' N.; longitude, 110° 40' W. Magnetic variation, 21° E. Elevation of barometer above sea-level, 2,984 (B.) feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Washington time.			Monthly mean.		Highest.		Lowest.		Date.		Range.		Washington time.			Self-registering thermometers.		Mean maximum.				Mean minimum.		Washington time.			Total.		Miles.		Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
7 p. m.	8 p. m.	11 p. m.	7 a. m.	11 p. m.	Monthly mean.	7 a. m.	8 p. m.	11 p. m.	Maximum.	Minimum.	Absolute range.	Maximum.	Minimum.	Date.	Maximum.	Minimum.	Date.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a

**B.—Elevation determined by barometer.**

\*One 7 a. m., three 3 p. m., two 11 p. m. observations missed.

September. January.

**June.**

**February.**

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 consecutive hours measure-ments.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Partly.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
										Largest amount.	Date.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.									Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1883.										In.	In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

\* One 7 a. m., three 3 p. m., two 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.45 a. m., 12.45 p. m., and 8.45 p. m., local time.

Correction for instrumental error of barometer used: From 4.45 p. m., January 1, to 8.45 p. m., December 31, inclusive, .028 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.860; February, 2.800; March, 2.860; April, 2.860; May, 2.790; June, 2.770; July, 2.710; August, 2.790; September, 2.840; October, 2.910; November, 2.960; December, 3.000.

THOMAS MORGAN,  
First Lieut., Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BIRMARCK, DAK.

[Latitude, 46° 47' N.; longitude, 100° 29' W. Magnetic variation, 1° E. Elevation of barometer above sea-level, 1,604 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain gauge above ground, 51 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.												
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometer.					Washington time.					Maximum hourly velocity during month.							
	7 a. m.		3 p. m.		11 p. m.	Range.	Date.	Lowest.	Date.	Highest.	Monthly mean.	7 a. m.		3 p. m.		11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 a. m. to 7 p. m.	7 p. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Date.		
	In.	Fa.	In.	Fa.								In.	Fa.	In.	Fa.																	In.	Fa.
1883.																																	
Jan .....	28.241	28.217	28.259	28.239	28.661	1.927	482	29	1.229	2.6	1.229	2.6	2.1	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Feb .....	28.828	28.811	28.841	28.827	28.765	1.27	812	10	.963	2.6	14.1	6.7	7.8	44.0	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Mar .....	28.209	28.259	28.250	28.263	28.785	2.27	598	17	1.217	16.1	27.1	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4	20.8	21.4
Apr .....	28.110	28.089	28.100	28.098	28.782	24.27	697	20	1.065	33.8	49.9	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3	40.2	41.3
May .....	28.158	28.125	28.143	28.142	28.531	10.27	518	18	1.031	42.5	58.4	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0	49.1	50.0
June .....	28.108	28.097	28.091	28.099	28.370	2.27	782	10	.588	57.8	73.2	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8	64.0	64.8
July .....	28.167	28.148	28.157	28.153	28.469	28.27	645	13	.848	58.8	75.7	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1	65.9	67.1
Aug .....	28.226	28.199	28.204	28.210	28.465	28.27	725	21	.730	55.8	75.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9	65.6	66.9
Sept .....	28.277	28.249	28.263	28.263	28.645	20.27	713	13	.983	45.9	67.7	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1	54.7	56.1
Oct .....	28.192	28.172	28.201	28.185	28.604	19.27	544	17	1.130	38.1	46.2	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4	39.0	40.4
Nov .....	28.166	28.150	28.188	28.141	28.608	11.27	626	24	1.037	19.6	34.2	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1	24.6	26.1
Dec .....	28.230	28.205	28.256	28.227	28.848	21.27	830	17	1.468	11.1	19.7	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3	12.1	14.3
Sums .....	333.452	333.150	333.415	333.350	333.850	.....	.....	.....	.....	373.845	2,439.1	462.6	.....	.....	462.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means .....	28.204	28.182	28.201	28.196	28.848	.....	.....	.....	.....	81.2	46.4	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7	36.6	37.7

\* Three 7 a. m. observations missed.

† Two 7 a. m. observations missed.

‡ December.

§ June.

|| January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.				Northeast.				East.				Southeast.				South.				Southwest.				West.				Northwest.				Number of calm.	Total amount.	Any 3 consecutive 8 hourly measurements.	Date.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Cloudy.	.01 inch or more of water.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	North.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 5.26 a. m., 1.26 p. m., and 9.26 p. m., local time.

Correction for instrumental error of barometer used: From 3.26 a. m., January 1, to 3.26 p. m., December 31, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by the following constants for the various months: January, 2.00; February, 1.96; March, 1.92; April, 1.88; May, 1.79; June, 1.76; July, 1.76; August, 1.76; September, 1.80; October, 1.83; November, 1.86; December, 2.02.

R. O. LENOIR,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BLOOM ISLAND, R. I.

[Latitude, 41° 19' N.; longitude, 71° 38' W. Magnetic variation, unknown. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 28 feet.]

Barometer (corrected for temperature and instrumental error only).											Temperature.						Wind.											
Month.	Washington time.			Monthly mean.			Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Washington time.				Maximum hourly velocity during month.		
	7 P. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.						Minimum.	Date.	Absolute range.	11 P. M.	7 P. M.	3 P. M.	Maximum.	Date.	Minimum.	Date.	11 P. M.	7 P. M.	3 P. M.	Total.		Miles.	Direction from—
1883.	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Jan.....	30.150	30.120	30.137	30.130	30.567	24.29.399	10	1.168	28.1	32.0	28.7	29.5	56.0	14	6.0	23	50.0	27.7	23.2	0	37.7	23.2	8.831	8.928	8.889	11.815	52	N.E.
Feb.....	30.210	30.184	30.231	30.208	30.738	24.29.555	7	1.181	30.5	31.4	32.2	34.9	0	19	15.0	27	34.0	39.1	25.6	0	39.1	25.6	8.720	8.843	8.843	10.965	46	N.W.
Mar.....	30.317	30.254	30.299	30.269	30.465	5.29.889	10	1.576	30.8	35.6	31.9	32.6	54.0	25	3.3	4.0	44.0	39.5	23.3	0	49.5	23.3	4.420	4.602	4.602	13.502	55	N.E.
Apr.....	30.387	30.358	30.387	30.377	30.464	14.29.593	6	.871	41.0	45.4	41.5	42.6	62.0	18	27.0	1	35.0	49.4	37.4	0	49.4	37.4	3.059	3.416	3.150	9.025	36	N.E.
May.....	30.461	30.331	30.368	30.350	30.420	1.29.531	15	.899	51.6	55.6	54.5	52.6	69.0	30	42.0	5	27.0	58.8	46.8	0	58.8	46.8	3.017	3.412	3.296	9.725	34	SW.
June.....	30.367	30.307	30.360	30.374	30.519	2.29.538	11	.931	63.4	67.8	62.1	64.4	78.0	24	51.5	2	26.5	69.2	58.7	0	69.2	58.7	2.562	3.206	3.062	8.850	24	S.
July.....	30.353	30.331	30.343	30.342	30.224	21.29.722	7	.502	68.4	73.6	67.6	69.9	82.0	6	55.0	1	27.0	75.5	63.4	0	75.5	63.4	2.764	3.366	3.360	9.500	46	N.
Aug.....	30.014	29.982	29.998	29.998	30.275	15.29.692	2	.583	65.1	71.1	65.5	67.2	81.0	21	56.0	37	25.0	72.6	61.3	0	72.6	61.3	2.894	3.269	3.279	9.452	47	N.E.
Sept.....	30.070	30.038	30.047	30.052	30.405	10.29.426	24	.979	59.7	65.0	59.9	61.5	75.5	15	41.5	10	34.0	66.5	55.0	0	66.5	55.0	3.268	3.310	3.181	8.729	30	W.
Oct.....	30.156	30.104	30.136	30.123	30.611	17.29.367	2	1.354	50.8	55.1	51.7	52.4	71.0	11	39.0	17	32.0	67.6	46.2	0	67.6	46.2	4.231	3.969	3.634	11.864	55	N.E.
Nov.....	30.116	30.078	30.094	30.096	30.570	17.29.590	12	.980	44.1	47.9	46.0	46.0	68.5	21	22.8	16	39.7	52.6	30.6	0	52.6	30.6	4.114	4.100	3.977	12.191	54	N.W.
Dec.....	30.067	30.031	30.050	30.049	30.632	23.29.229	27	1.423	33.7	36.1	35.1	35.0	53.0	8	-1.0	29	52.0	43.4	28.1	0	43.4	28.1	4.496	4.735	4.146	13.267	55	N.W.
Sums.....	360.617	360.175	360.440	360.417	.....	.....	.....	.....	586.2	619.7	572.9	586.2	.....	.....	.....	.....	.....	602.9	610.6	.....	602.9	610.6	42.826	45.004	42.989	126.976	.....	.....
Means.....	30.051	30.015	30.037	30.034	30.736	*24.29.889	110	.....	47.2	51.6	47.7	48.5	62.0	19	-1.0	52	.....	55.2	43.6	.....	55.2	43.6	4.277	4.533	4.276	126.976	.....	.....
											† March.						‡ July.						§ December.					

} December.

} July.

} March.

} February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—						Remarks.											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Any 3 consecutive hourly measurements.			Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Part.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.				
											Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									7 a. m.	3 p. m.	11 p. m.	Mean.
1883.																																	
Jan.....	28	18	4	6	1	6	11	12	7	3.95 0.90'	20, 21	6.5	6.1	5.8	6.0	21.9	24.6	22.8	23.1	77.5	74.3	76.9	76.2	6	15	10	16	9	27	0	February 27, earthquake shocks.		
Feb.....	19	9	1	5	0	8	21	18	3	4.09 1.16'	6, 7	4.8	5.6	4.8	4.9	23.0	24.7	22.9	24.2	72.4	70.3	72.4	72.4	7	14	7	13	3	25	0			
Mar.....	83	15	0	8	2	22	8	9	1	2.47 1.34	10	2.7	4.0	3.8	3.7	20.8	24.7	24.0	23.2	67.5	65.3	72.3	68.8	15	12	4	6	4	26	0			
Apr.....	19	23	3	7	3	28	5	2	0	3.49 0.95	22, 23	4.6	5.1	3.7	4.5	33.5	38.6	36.7	36.0	81.1	78.8	83.9	81.1	10	15	9	12	0	8	0			
May.....	7	17	4	13	11	29	6	6	0	2.89 1.08	22	4.2	4.8	3.2	4.1	44.2	43.2	45.9	46.8	82.8	77.8	84.7	81.8	7	22	5	13	0	0	0			
June.....	4	8	4	15	8	46	6	4	0	1.54 0.56	27, 28	4.1	3.1	4.1	3.8	60.8	62.5	59.7	61.0	91.7	83.9	92.1	89.2	12	18	5	13	0	0	0			
July.....	5	10	1	2	7	41	13	13	1	3.53 1.42	16	3.9	4.2	3.1	3.7	63.5	64.9	63.4	63.9	84.9	75.3	86.4	82.2	15	13	7	7	0	0	0			
Aug.....	11	22	4	5	1	30	8	10	2	1.74 0.73	2, 3	4.0	3.5	3.1	3.5	59.6	61.1	60.2	60.3	82.9	72.8	83.6	79.6	8	12	8	7	0	0	0			
Sept.....	10	23	5	8	3	27	7	6	1	2.60 1.16	12, 13	4.8	4.8	3.8	4.0	53.6	55.4	54.1	54.4	72.8	62.0	82.0	78.7	8	12	10	12	0	0	0			
Oct.....	16	24	8	6	7	13	5	3	1	7.38 2.64	23, 24	4.4	5.0	5.0	4.8	44.8	47.7	44.5	45.7	81.9	77.7	77.7	79.1	10	14	7	12	0	0	0			
Nov.....	19	8	3	2	6	32	8	12	0	3.16 1.88	26, 27	4.8	4.8	3.4	4.3	38.3	40.8	40.1	39.6	80.5	75.7	80.1	78.7	9	15	6	14	0	5	0			
Dec.....	15	22	1	6	4	16	4	22	8	2.85 0.60	16, 17	5.2	6.5	5.5	5.7	23.0	23.8	23.7	23.5	82.6	78.2	80.8	80.5	10	10	11	13	2	19	0			
Sums ..	196	204	38	78	53	298	102	117	19	39.06	.....	55.0	57.5	49.3	54.0	49.7	50.5	50.8	70.68	2.301	9.973	8.947	8	124	187	74	138	17	105	0			
Percentages.																	Percentages.																
Means	17.018	63.5	7.14	8.27	3.9	3.10	7.1	.....	.....	.....	.....	4.6	4.8	4.1	4.5	41.4	43.6	42.1	43.4	80.7	76.2	81.2	79.0	0.84	0.45	7.20	3.87	8	4.72	8	0		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.22 a. m., 3.22 p. m., and 11.22 p. m., local time.

Correction for instrumental error of barometer used: From 7.22 a. m., January 1, to 11.22 p. m., December 31, inclusive, +.015 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

J. T. EIKER,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BOISE CITY, IDAHO.

[Latitude, 43° 37' N.; longitude, 116° 8' W. Magnetic variation, 19° 15' E. Elevation of barometer above sea-level, 2,750 (B.) feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 33 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.							Wind.										
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Washington time.							
	7 p. m.		3 p. m.		11 p. m.	Range.	Date.	Lowest.	Date.	Highest.	Monthly mean.	Date.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Maximum hourly velocity during month.	Date.	
	In.	Th.	In.	Th.																								In.
1883.																												
Jan.	27.301	27.330	27.312	27.334	27.871	15	72.861	15	91.0	12.6	28.8	28.7	21.0	40.3	24	27.0	18	76.3	34.0	10.1	703	648	619	2,270	54	SE. NW.	7.17	
Feb.	27.873	27.359	27.863	27.865	27.836	19	1.154	19	1.154	14.1	27.6	23.1	21.8	54.0	21	12.0	4	68.0	33.2	11.0	587	625	825	2,038	28	NE.	18	
Mar.	27.232	27.227	27.184	27.214	27.459	29	2.84	29	8.70	32.1	56.0	48.5	46.2	72.0	28	30	44.5	60.2	33.0	777	778	1,013	2,598	28	SE.	4.9		
Apr.	27.135	27.124	27.105	27.121	27.589	12	14.26	12	8.70	32.1	56.0	48.5	46.2	72.0	28	30	44.5	60.2	33.0	777	778	1,013	2,598	28	NE.	13		
May	27.135	27.124	27.105	27.121	27.589	12	14.26	12	8.70	32.1	56.0	48.5	46.2	72.0	28	30	44.5	60.2	33.0	777	778	1,013	2,598	28	NE.	13		
June	27.228	27.149	27.125	27.151	27.487	10	2.46	10	6.92	34.0	78.8	72.4	68.6	96.0	30	31	53.2	70.6	43.6	1,005	1,131	1,311	3,890	28	SE.	4.6		
July	27.228	27.149	27.125	27.151	27.487	10	2.46	10	6.92	34.0	78.8	72.4	68.6	96.0	30	31	53.2	70.6	43.6	1,005	1,131	1,311	3,890	28	SE.	20.39		
Aug.	27.193	27.194	27.128	27.191	27.372	11	4.31	11	4.31	35.9	88.6	77.8	73.2	105.0	27	49	31	56.0	86.7	52.5	678	674	827	2,170	26	SE.	9	
Sept.	27.210	27.187	27.153	27.183	27.557	14	5.49	14	5.49	47.4	73.6	65.0	62.0	94.8	4	35.5	29	58.8	81.3	46.0	622	571	920	2,113	26	NW.	12	
Oct.	27.210	27.196	27.176	27.194	27.487	8	6.37	8	6.37	38.7	51.0	45.9	44.5	73.0	1	26.0	23	47.0	56.8	35.4	470	705	938	2,113	24	NW.	17	
Nov.	27.200	27.207	27.223	27.203	27.694	24	1.055	24	1.055	30.3	46.0	41.5	38.3	58.0	23	19.3	21	38.7	52.3	28.8	673	569	786	2,028	25	NW.	18	
Dec.	27.847	27.336	27.328	27.335	27.878	21	.974	21	.974	49.7	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	806	856	1,091	2,753	26	SW.	23	
Sums.	378.968	378.968	378.968	378.968	378.968	227	.....	.....	.....	682.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,225	10,055	13,621	32,901	.....	.....	.....	.....
Means.	27.242	27.220	27.195	27.219	27.578	24	731.26	731.26	731.26	56.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	768.8	837.9	1,135.1	.....	.....	.....	.....	.....

B.—Elevation determined by barometer.

† Fourteen 7 a. m. observations missing.  
 ‡ Seven 8 p. m. observations missing.  
 § Nine 11 p. m. observations missing.

† Seven observations missing.  
 ‡ No observations.  
 § Six 8 p. m. observations missing.

† December.  
 ‡ November.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.		
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.
1888.																															
Jan.....	10	8	0	20	2	2	14	27	9	3.77	0.99	16	5.2	6.3	5.6	5.7	11.5	21.3	19.1	17.3	90.5	79.9	82.4	84.3	10	8	13	10	12	28	0
Feb.....	11	2	4	8	2	1	22	26	9	3.77	0.85	14	3.1	3.5	2.7	3.1	10.4	19.4	17.0	15.5	89.1	72.2	78.0	79.8	16	8	4	3	12	28	0
Mar.....	7	3	1	10	2	13	30	27	1	0.28	0.28	26	1.9	3.8	2.6	2.8	27.5	40.8	35.3	34.5	77.1	57.7	61.4	65.4	19	9	8	2	0	12	0
Apr.....	10	5	4	12	2	2	24	32	0	0.61	0.15	20	5.2	6.1	5.3	5.5	29.2	41.8	39.0	36.7	87.0	68.8	73.1	76.3	10	9	11	10	0	13	0
May.....	12	3	4	8	0	2	24	38	2	2.12	0.85	7	3.6	5.2	3.9	4.2	38.9	41.7	42.5	41.0	70.2	44.6	57.8	60.5	11	16	4	6	0	1	0
June.....	7	2	2	14	0	4	17	41	3	0.20	0.17	2	2.1	3.5	2.8	2.8	42.9	47.7	46.3	45.5	171.8	38.1	46.6	52.8	16	12	2	6	0	0	8
July.....	4	2	4	5	2	5	41	43	6	(*)	(*)	(*)	2.0	0.7	2.2	2.2	34.0	47.7	46.3	45.5	171.8	38.1	46.6	52.8	16	12	2	6	0	0	8
Aug.....	8	3	3	8	5	12	18	34	2	(*)	(*)	(*)	2.0	0.7	2.2	2.2	34.0	47.7	46.3	45.5	171.8	38.1	46.6	52.8	16	12	2	6	0	0	8
Sept.....	9	1	2	7	1	10	15	41	5	0.20	0.11	27	6.0	5.6	5.6	5.7	33.7	39.5	38.4	37.2	89.2	68.9	75.7	77.3	8	11	12	13	0	6	0
Oct.....	6	6	2	7	1	10	15	41	5	0.46	0.19	8	3.9	5.0	4.7	4.5	27.0	34.3	33.8	31.7	87.5	65.4	74.8	75.7	14	6	10	4	0	23	0
Nov.....	8	1	3	9	0	9	21	43	1	0.46	0.19	8	3.9	5.0	4.7	4.5	27.0	34.3	33.8	31.7	87.5	65.4	74.8	75.7	14	6	10	4	0	23	0
Dec.....	8	1	3	9	0	9	21	43	1	0.46	0.19	8	3.9	5.0	4.7	4.5	27.0	34.3	33.8	31.7	87.5	65.4	74.8	75.7	14	6	10	4	0	23	0
Sums..	93	33	31	121	20	73	248	400	83	38.0	50.9	44.2	43.4	3.2	4.2	3.7	3.6														
Means.	8.3	1.2	0.1	5.1	0.9	2.3	6.3	0.3	1	3.2	4.2	3.7	3.6																		
										Percentages.									Percentage.												

\*Thirteen 7 a. m. observations missing;  
 \*Ten 3 p. m. observations missing;  
 \*Twelve 11 p. m. observations missing;  
 \*Fifty observations only.  
 \*Incomplete.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 4.24 a. m., 12.24 p. m., and 8.24 p. m. local time.  
 Correction for instrumental error of barometer used: From 4.24 a. m., January 1, to 8.24 p. m., December 31, inclusive, +.014 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.930; March, 2.926; April, 2.840; May, 2.849; June, 2.780; July, 2.720; August, 2.750; September, 2.770; October, 2.860; November, 2.940; December, 2.930.

\*Inappreciable.

JAMES KENEALY,  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BOSTON, MASS.

[Latitude, 42° 21' N.; longitude, 71° 4' W. Magnetic variation, 11° W. Elevation of barometer above sea-level, 143 feet. Elevation of exposed thermometer above ground, 156 feet. Elevation of rain-gauge above ground, 163 feet.]

Month.	Barometer (corrected for temperature and instrumental error only.)										Temperature.								Wind.														
	Washington time.					Monthly mean.					Washington time.				Self-registering ther- mometers.				Washington time.				Maximum hourly velocity during month.										
	7 p. m.	8 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Date.	Lowest.	Range.	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.		Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	8 p. m. to 7 a. m.	7 a. m. to 8 p. m.	8 p. m. to 7 a. m.	Total.	Miles.	Direction	Date.			
1883.																																	
Jan.	30.028	29.979	30.009	30.005	30.288	19.28	30.309	21	1.019	1.019	22.8	28.8	29.3	29.3	29.3	21	-0.5	23.00	0	38.8	15.3	2.197	2.658	2.538	7.893	28	N.	10					
Feb.	30.054	30.015	30.016	30.045	30.826	24.28	31.19	7	1.907	1.907	28.8	32.8	27.4	29.2	29.2	11	11.0	24	28.48	38.8	19.3	2.540	2.540	2.540	7.624	24	N.	15					
Mar.	29.765	29.704	29.788	29.745	30.850	17.28	30.428	10	1.408	1.408	28.8	32.8	27.4	29.2	29.2	18	8.0	18.51	0	40.4	21.1	2.562	2.609	2.068	8.289	26	N.E.	10					
Apr.	29.859	29.807	29.853	29.840	30.535	14.28	30.428	6	1.807	1.807	41.5	44.1	42.4	44.1	44.1	10	22.0	18.51	0	54.7	33.8	1.730	2.641	2.044	10.416	27	N.E.	6					
May	29.832	29.782	29.827	29.814	30.297	12.8	30.416	11	1.881	1.881	53.9	56.9	52.7	56.9	56.9	26	37.0	18.51	0	66.0	47.8	1.753	2.548	2.279	8.881	28	N.W.	23					
June	29.842	29.804	29.852	29.826	30.389	21.28	31.19	7	1.070	1.070	67.3	74.4	67.6	71.3	71.3	6	51.0	28.8	8	78.9	60.3	1.691	2.269	1.971	6.861	28	N.W.	14					
July	29.814	29.768	29.794	29.793	30.089	21.28	30.531	8	1.848	1.848	68.4	77.8	64.7	67.6	67.6	23	48.0	29.43	8	82.2	61.2	1.802	2.344	2.071	6.217	27	N.W.	2					
Aug.	29.836	29.801	29.813	29.823	30.189	15.28	30.531	8	1.668	1.668	63.8	74.4	64.7	59.3	59.3	17	41.0	10.88	0	68.4	51.1	1.909	2.561	2.150	6.104	24	N.W.	25					
Sept.	30.030	29.960	30.013	30.018	30.516	17.28	31.12	26	1.404	1.404	44.2	52.0	46.1	47.4	47.4	11	24.4	23.51	0	56.2	39.2	2.044	2.505	2.188	6.777	25	N.W.	20					
Oct.	29.837	29.817	29.841	29.837	30.429	23.28	30.845	12	1.084	1.084	28.1	47.4	40.9	42.5	42.5	22	14.0	13.54	8	51.8	33.8	2.399	2.783	2.490	7.683	40	N.W.	13					
Nov.	29.916	29.874	29.902	29.897	30.529	23.28	30.845	27	1.489	1.489	25.8	32.2	28.1	28.7	28.7	8	12.0	23.70	0	57.5	20.9	2.853	2.789	2.490	7.456	26	N.W.	25					
Dec.	30.018	29.983	30.003	30.003	30.806	23.28	30.845	27	1.489	1.489	25.8	32.2	28.1	28.7	28.7	8	12.0	23.70	0	57.5	20.9	2.853	2.789	2.490	7.456	26	N.W.	25					
Sum.	305.918	303.361	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803	303.803			
Means.	29.910	29.863	29.901	29.891	30.030	24.28	30.943	19	1.408	1.408	44.8	53.4	45.6	47.6	47.6	12.0	12.0	12.0	57.2	38.7	28.7	2.501	2.501	2.501	7.624	24	N.	12	Averages.	31.708	27.860	33.079	.....

1 December.

1 July.

1 March.

1 February.

1 For 304 days.

1 For 304 days.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Number of calms.	Rainfall or melted snow.	Washington time.				Relative humidity (per cent.).				Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
											Cloudiness (in tenths).		Dew-point.		7 a. m.		8 p. m.		11 p. m.		Mean.			Clear.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Total amount.	Any 3 consecutive hourly measurements.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.24 a. m., 3.24 p. m., and 11.24 p. m., local time. Correction for instrumental error of barometer used: From 7.24 a. m., January 1, to 11.24 p. m., December 31, inclusive,  $-\frac{1}{10}$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.170; February, 0.160; April, 0.160; May, 0.160; June, 0.150; July, 0.150; August, 0.150; September, 0.150; October, 0.160; November, 0.160; December, 0.160.

O. B. COLE,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Mc curiological summary for the year ending December 31, 1883*—Continued.

## BROWNSVILLE, TEX.

[Latitude, 29° 53' N.; longitude, 97° 26' W. Magnetic variation, 8° 30' E. Elevation of barometer above sea-level, 50 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 40 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.														
Washington time.			Monthly mean.			Self-registering thermometers.			Washington time.			Mean maximum.			Mean minimum.			Washington time.			Wind.			Maximum hourly velocity during month.						
7 a. m.	3 p. m.	11 p. m.	In.	Th.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Date.							
1883.																														
Jan	30.069	30.060	30.116	30.068	30.551	22.29	788	18	763	50.6	62.2	58.5	55.4	79.0	19	25.9	21	53.1	64.9	44.4	1.641	2.216	2.056	5,913	36	S.	12			
Feb	30.105	30.099	30.130	30.113	30.543	27.23	689	15	884	54.7	64.0	57.8	58.8	82.5	16	27.0	5	53.5	68.2	51.9	2.244	2.044	2.729	8,017	33	S.	16			
Mar	30.051	30.082	30.094	30.130	30.531	24	531	24	785	62.6	74.9	65.0	67.5	88.3	23	45.0	8	44.8	78.4	60.4	1.618	2.072	2.711	7,061	32	S.	16			
Apr	30.817	30.804	30.841	30.821	30.349	15.28	374	22	975	70.0	81.1	71.9	74.9	94.0	21	57.7	17	52.9	83.2	67.0	2.132	2.897	2.620	7,949	38	S.	5			
May	29.874	29.853	29.894	29.875	30.066	6.28	679	29	417	74.4	86.2	77.0	79.2	95.3	11	58.0	23	57.3	88.7	71.7	1.623	2.938	2.700	7,261	34	S.	17			
June	29.886	29.862	29.891	29.880	29.966	1.28	603	9	863	79.1	89.3	81.6	83.3	95.0	17	70.0	28	65.0	91.1	76.4	1.231	2.289	2.191	5,711	24	S.	2			
July	29.983	29.975	29.982	29.980	30.141	18.28	848	14	293	78.0	91.9	80.0	83.0	98.0	29	80.0	1,2	29.0	98.9	75.0	1.208	2.212	2.165	5,565	24	S.E., S.	5			
Aug	29.947	29.932	29.943	29.944	30.088	14.28	810	12	228	76.8	93.4	80.6	83.6	101.0	9	70.0	27	31.0	94.4	75.1	886	1,631	1,862	4,899	17	S., S.E., S.	3			
Sept	29.946	29.921	29.949	29.940	30.094	26.28	780	4	314	71.7	88.4	78.0	77.7	94.0	18	57.0	22	32.0	87.8	70.0	632	1,198	1,187	3,017	30	N.	19			
Oct	29.917	29.881	29.908	29.911	30.203	31.28	690	28	504	73.4	88.2	78.5	78.5	92.0	8	58.0	36.0	87.9	71.6	809	2,045	1,784	4,645	30	S.	8.	23			
Nov	30.026	30.987	30.041	30.018	30.402	16.28	643	10	759	64.4	75.8	67.8	69.2	88.6	11	46.0	23	42.6	77.7	63.1	1,133	1,873	1,762	4,768	28	S.	8.	21		
Dec	30.031	30.032	30.031	30.058	30.528	15.28	779	18	749	87.7	67.9	60.2	61.9	80.0	6	38.0	16	42.0	68.5	55.8	1,633	2,374	2,108	6,112	29	S.	8.	18		
Sum.	352,002	359,943	359,709	359,590	.....	.....	.....	.....	818.4	957.2	848.8	872.4	.....	.....	.....	.....	.....	.....	985.7	778.0	16,910	27,509	70,022	70,441	.....	.....	.....	.....	.....	.....
Means	29.967	29.945	29.983	29.980	30.051	.....	.....	.....	87.8	79.8	70.6	72.7	710.1	.....	.....	.....	.....	.....	82.1	85.3	1,400.2	2,952.4	2,165.5	.....	.....	.....	.....	.....	.....	.....
: August.																														
: April.																														
: January.																														

; August.

† April.

\* January.

Winds at 7 a.m., 3 and 11 p.m. Washington time: Number of times observed blowing from—										Rainfall or melted snow.		Washington time.				Number of days—				Remarks.									
Month.	North.					South.					Number of calms.		Any 3 consecutive hours measure-ments.	Cloudiness (in tenths).			Dew-point.				Relative humidity (per cent.).			Clear.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Largest amount.	Date.	7 a.m.		11 p.m.	Mean.	7 a.m.	11 p.m.	Mean.	7 a.m.		11 p.m.	Mean.							
1883.																													
Jan.....	39	8	0	2	31	2	0	0	11	1.23 0.57	1	47.2	47.8	48.6	47.9	88.6	83.4	82.7	78.2	11	7	13	0	0	0	0	0	0	
Feb.....	33	9	1	3	37	0	0	0	1	1.01 0.29	8	51.4	53.5	54.4	53.1	89.2	89.9	88.7	82.6	2	10	16	1	0	0	0	0	0	
Mar.....	14	6	20	8	34	2	0	0	9	0.63 0.29	7	60.3	60.6	61.3	60.7	92.2	93.2	88.1	81.2	0	16	9	0	0	0	0	0	0	
Apr.....	9	15	18	6	33	1	1	0	7	0.38 0.14	26	63.0	63.0	66.8	66.1	86.9	89.4	84.6	77.6	4	17	9	0	0	0	0	0	0	
May.....	2	17	18	20	39	1	1	0	4	0.83 0.39	4	69.5	67.1	70.7	69.1	84.4	84.5	81.6	73.6	6	18	5	0	0	0	0	0	0	
June.....	1	1	12	24	45	2	1	0	5	0.66 1.83	28	74.9	75.7	75.7	75.1	86.3	86.3	82.9	77.5	12	13	6	0	0	0	0	0	0	
July.....	0	0	8	41	38	4	0	0	2	4.02 2.34	1	72.9	73.7	73.4	73.2	90.0	87.9	87.3	78.1	14	11	6	0	0	0	0	0	0	
Aug.....	4	0	17	32	26	4	0	0	10	1.97 1.55	26	74.3	70.6	74.6	73.2	92.1	92.5	87.4	80.6	7	13	10	0	0	0	0	0	0	
Sept.....	17	7	16	14	7	4	0	0	23	7.74 5.75	3	69.3	69.6	71.8	70.2	90.4	88.9	86.7	78.7	12	17	2	0	0	0	0	0	0	
Oct.....	7	2	4	17	32	0	0	0	31	1.65 1.15	14	70.4	70.1	71.5	70.7	89.6	87.7	86.6	81.3	4	17	9	0	0	0	0	0	0	
Nov.....	26	0	7	12	16	0	1	5	23	3.32 1.12	12	63.5	63.5	63.0	63.5	86.6	87.7	86.6	81.3	4	17	9	0	0	0	0	0	0	
Dec.....	33	4	2	11	24	2	1	1	15	2.59 1.40	10	56.9	56.9	57.3	56.6	93.6	90.5	90.5	84.8	8	14	9	0	0	0	0	0	0	
Sums ..	185	59	123	190	362	22	5	8	141	31.02	.....	62	678.4	674.6	674.2	679.1	877.8	838.1	829.1	788.5	100	168	97	91	1	7	107	.....	
Means ..	16.9	5.4	11.2	17.3	33.3	2.2	0.0	5.0	12.9	5.2	6.5	4.1	5.3	64.6	64.4	66.0	65.0	89.8	81.5	85.8	79.0	27.4	26.9	0.3	1.9	23.3	.....	.....	.....

NOTE.—7 a.m., 8 p.m., and 11 p.m., Washington time, correspond with 5.38 a.m., 1.38 p.m., and 9.38 p.m., local time. Correction for instrumental error of barometer used: From 5.38 a.m., January 1, to 9.38 p.m., December 31, inclusive, +.002 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.060; February, 0.060; March, 0.060; April, 0.060; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.060; November, 0.060; December, 0.060.

JOHN MCGLONE,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BUFFALO, N. Y.

[Latitude, 42° 53' N.; longitude, 78° 53' W. Magnetic variation, 3° 30' W. Elevation of barometer above sea-level, 860 feet. Elevation of exposed thermometer above ground, 107 feet. Elevation of rain-gauge above ground, 98 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.													
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.			Mean maximum.				Mean minimum.	Washington time.				Maximum hourly velocity during month.			
	7 a. m.	3 p. m.	11 p. m.						Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Date.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.		Direction from—	Date.						
1883.	In.	Th.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Date.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Date.				
Jan.....	29.356	29.333	29.355	29.348	29.784	4.28.687	20	1.097	18.9	32.6	20.6	20.7	20.7	47.5	21	0	22.53	5	28.0	14.2	3.364	3.582	3.815	10.261	50	SW.	21	
Feb.....	29.422	29.422	29.424	29.423	29.799	7.28.892	7	1.007	21.0	25.7	23.2	23.8	23.8	16	6.8	8.57	0	8.57	0	31.2	15.8	3.423	3.646	3.423	10.125	46	SW.	12
Mar.....	29.257	29.218	29.215	29.208	30.714	13.28.778	10	1.734	21.6	44.1	39.0	40.2	49.7	1	2.0	8.47	7	8.47	7	32.5	15.9	3.783	3.309	3.395	9.497	43	SW.	25
Apr.....	29.224	29.190	29.193	29.186	29.512	17.28.898	30	2.724	27.6	53.0	49.4	50.0	82.6	14	18.8	1.263	8	48.5	32.8	11.1	1.913	2.418	2.188	6.519	44	SW.	31	
May.....	29.218	29.191	29.193	29.186	29.190	29.637	1	28.756	11	90.1	61.1	67.2	63.1	66.7	5.45	7	1.84	1.72	57.0	60.7	2.000	2.649	2.005	6.651	46	SW.	17	
June.....	29.256	29.227	29.238	29.241	29.474	20.28.925	12	5.549	82.3	70.5	64.5	65.8	83.5	8	51.7	1.28	0	72.8	58.8	1.852	2.833	2.439	7.207	36	SW.	30		
July.....	29.324	29.299	29.311	29.311	29.560	27.28.978	24	1.091	83.2	63.8	55.5	57.5	80.5	16	25.6	22.47	0	73.8	58.8	1.852	2.833	2.439	7.207	36	SW.	26		
Aug.....	29.366	29.318	29.324	29.324	29.743	10.28.652	24	1.091	83.2	63.8	55.5	57.5	80.5	16	25.6	22.47	0	73.8	58.8	1.852	2.833	2.439	7.207	36	SW.	30		
Sept.....	29.305	29.369	29.369	29.369	29.949	16.28.530	29	1.410	45.6	52.2	47.2	43.4	77.8	9	28.8	17.48	6	55.8	41.4	2.033	2.595	2.279	7.007	46	SW.	20		
Oct.....	29.305	29.269	29.269	29.269	29.724	28.28.806	6	0.818	41.6	46.5	42.4	43.5	68.0	5	17.4	23.51	6	41.5	35.4	3.425	3.634	3.403	9.462	53	SW.	13		
Nov.....	29.295	29.261	29.281	29.279	29.631	23.28.764	27	1.067	32.9	35.9	33.8	34.0	57.6	7	6.0	23.51	6	41.5	35.4	3.425	3.634	3.403	9.462	53	SW.	10		
Dec.....	351.637	351.276	351.465	351.439	.....	.....	.....	.....	508.3	578.6	528.3	538.4	.....	.....	.....	.....	.....	631.0	448.9	29.926	35.572	33.311	68.909	.....	.....	.....		
Sums.	351.637	351.276	351.465	351.439	.....	.....	.....	.....	508.3	578.6	528.3	538.4	.....	.....	.....	.....	.....	631.0	448.9	29.926	35.572	33.311	68.909	.....	.....	.....		
Means.	30.307	30.273	30.289	30.288	30.949	116.28.530	129	.....	42.4	46.2	44.0	44.9	83.5	22	6.0	52.2	.....	52.6	37.4	2.493	3.2064	3.2775	9.9	.....	.....	.....		
										† October.					† August.					6 January.								

§ January.

† August.

‡ October.

• For 30 days.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.							
	North. Northeast. East. Southeast. South. Southwest. West. Northwest.								Any 3 consecutive hours exceeding one-half inch.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear. Fair. Cloudy. .01 inch or more of water. Maximum below 32°. Minimum below 32°. Maximum below 80°.												
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.							8 p. m.	11 p. m.	Mean.				
1888.																																
Jan.....	2	21	3	8	15	33	7	4	0	1.690.32	8.6	7.5	8.2	15.2	16.8	15.8	15.9	84.7	78.0	81.4	81.4	0	19	22	16	19	31	0				
Feb.....	0	12	4	5	18	49	11	2	1	4.041.26	7.1	6.6	6.9	17.5	18.8	18.7	18.7	86.9	78.2	83.0	82.4	0	15	8	15	20	19	26	9			
Mar.....	8	23	3	5	19	37	17	4	0	1.080.21	5.2	5.4	5.4	15.0	15.0	15.0	15.0	86.9	78.2	83.0	82.4	0	9	12	14	16	31	0				
Apr.....	5	23	0	0	20	17	4	0	0	2.840.73	6.7	6.5	6.7	30.5	31.5	31.5	31.5	86.9	78.2	83.0	82.4	0	7	13	10	12	1	0	0			
May.....	7	15	1	0	20	29	5	2	0	4.451.96	7.0	6.8	7.0	38.9	41.2	40.8	40.8	86.9	78.2	83.0	82.4	0	7	10	14	17	0	0	0			
June.....	6	11	24	36	6	2	9	2	0	5.481.59	5.7	5.8	5.8	54.8	56.8	55.4	56.8	86.9	78.2	83.0	82.4	0	6	13	11	13	0	0	0			
July.....	7	9	0	2	20	26	9	2	0	3.850.87	6.4	6.0	6.4	59.0	59.0	58.2	59.0	86.9	78.2	83.0	82.4	0	14	13	9	13	0	0	0			
Aug.....	7	17	3	8	16	28	9	2	0	2.801.26	5.1	4.4	5.1	54.7	56.8	55.4	56.8	86.9	78.2	83.0	82.4	0	16	11	8	13	0	0	0			
Sept.....	5	26	8	8	12	17	7	7	0	5.581.16	5.8	7.0	6.3	40.3	38.8	40.6	39.9	86.9	78.2	83.0	82.4	0	6	11	11	12	0	0	0			
Oct.....	7	37	4	7	8	14	7	6	0	2.110.72	5.6	6.6	6.6	47.3	48.5	50.2	48.5	86.9	78.2	83.0	82.4	0	6	11	14	16	1	0	0			
Nov.....	2	6	4	9	18	27	24	9	0	2.980.92	6.7	7.1	6.3	34.2	33.8	33.1	33.7	86.9	78.2	83.0	82.4	0	4	12	14	16	1	0	0			
Dec.....	3	6	4	9	15	22	24	9	0	2.740.88	7.4	8.4	7.1	24.3	24.3	24.3	24.3	86.9	78.2	83.0	82.4	0	4	14	17	16	6	19	0			
Sums ..	47	188	40	83	195	341	128	67	1	38.07	77	382	64	574	6432	6442	4443	8439	7944	7806	4987	9883	1	73	140	152	170	62	135	0		
Means ..	Percentages.																				Percentages.											
	4.317 23.68 5.17 8.31 11.1 24.10 1																				30.0 38.3 41.7 46.6 61.7 037.0					74.4						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.52 a. m., 2.52 p. m., and 10.52 p. m., local time. Corrections for instrumental errors of barometer used: From 6.52 a. m., January 1, to 10.52 p. m., October 31, inclusive, +0.006 inch.; from 6.52 a. m., November 1, to 10.52 p. m., December 12, inclusive, +0.001 inch.; from 6.52 a. m., December 13, to 10.52 p. m., December 31, inclusive, +0.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.790; February, 0.790; March, 0.780; April, 0.770; May, 0.740; June, 0.780; July, 0.720; August, 0.720; September, 0.730; October, 0.750; November, 0.770; December, 0.790.

WM. FLINN,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

BUFFORD, FORT, DAK.

[Latitude, 48° N.; longitude, 103° 56' W. Magnetic variation, 13° 30' E. Elevation of barometer above sea-level, 1890 (B) feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 0 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Mean minimum.		Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Maximum.	Date.	Minimum.	Abnormal range.	Date.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	3 p. m. to 7 a. m.	11 p. m. to 3 p. m.		Total.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1883.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

B.—Elevation determined by barometer.

\* December.

† June.

; January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—								Remarks.	
	North.	Northeast.	East.	Southeast.	South.	West.	Northwest.	Number of calms.	Total amount.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.		Maximum above 90°.
									Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.								
1888.																												
Jan.	4	8	6	1	7	3	15	24	1.981	26	5.3	12.6	4.7	11.2	0.5	80.4	79.2	81.4	80.3	4	16	7	6	25	27	0		
Feb.	14	13	10	5	6	10	11	14	0.840	27	2.5	6.4	4.9	1.9	1.1	82.9	72.1	76.3	77.1	17	8	2	3	23	28	0		
Mar.	4	11	23	6	7	9	17	13	0.910	28	3.0	10.2	21.3	16.2	15.9	76.4	74.0	81.0	77.1	18	15	8	7	15	14	0		
Apr.	6	15	15	6	7	9	12	16	0.480	29	2.4	24.5	30.7	31.1	29.4	78.0	50.5	71.8	66.6	14	13	3	4	6	6	0		
May	5	6	11	7	12	9	13	15	0.590	29	2.3	4.2	34.4	35.9	35.6	77.0	48.5	65.2	62.4	9	18	3	6	4	6	0		
June	6	11	7	12	9	13	15	2	0.970	30	2.4	5.0	49.4	52.9	52.1	78.0	48.5	65.2	62.4	9	18	3	6	4	6	0		
July	7	15	9	16	4	3	16	11	0.690	31	6	4.8	49.4	49.9	51.1	50.1	38.9	65.8	60.9	9	18	4	7	0	0	0		
Aug.	17	18	21	11	4	3	16	11	0.960	70	1.3	5.0	54.5	54.5	51.1	85.7	49.3	65.8	60.9	14	14	3	2	0	0	0		
Sept.	13	9	12	6	11	1	10	20	0.220	17	2.8	4.4	38.8	40.5	37.9	88.4	81.3	87.0	81.3	16	11	3	2	0	0	0		
Oct.	8	10	6	2	14	8	27	15	1.410	45	7.0	6.6	29.3	34.2	31.9	87.0	66.8	82.7	78.7	4	12	15	14	0	14	0		
Nov.	8	11	7	5	5	23	16	3	0.140	04	6.2	5.8	13.7	18.9	14.7	55.8	67.9	63.9	60.9	4	18	8	16	17	20	0		
Dec.	7	11	7	5	5	23	16	3	0.110	04	6.2	3.9	4.8	10.3	2.4	87.7	70.2	82.9	83.8	8	12	7	5	14	20	0		
Sums	93	124	158	73	104	70	209	177	49.10.82	.....	46.8	535.0	431.2	431.6	0.985	0.707	8.885	0.859	5	115	163	68	84	96	182	16		
Means	Percentages.								Percentages.				Percentages.				Percentages.				Percentages.							
	6.8								3.9				23.8				82.1				71.5				71.5			

<sup>1</sup> Three 7 a. m., four 3 p. m., four 11 p. m., observations missed.

<sup>2</sup> One 7 a. m., observation missed.

<sup>3</sup> Four 7 a. m., four 11 p. m., observations missed.

<sup>4</sup> Three 7 a. m., three 3 p. m., three 11 p. m., observations missed.

<sup>5</sup> For 23 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.12 a. m., 1.12 p. m., and 9.12 p. m., local time. Corrections for instrumental errors of barometer used: From 5.12 a. m., January 1, to 1.12 p. m., October 9, inclusive, +.013 inch; from 9.12 p. m., October 9, to 9.12 p. m., December 31, inclusive, +.021 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.230; February, 2.210; March, 2.160; April, 2.100; May, 2.000; June, 1.960; July, 1.960; August, 1.980; September, 2.020; October, 2.100; November, 2.160; December, 2.270.

A. SCHNEIDER,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CAIRO, ILL.

[Latitude, 37° 6' N.; longitude, 89° 10' W. Magnetic variation, 30° E. Elevation of barometer above sea-level, 377 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.										
	Washington time.					Washington time.					Self-registering thermometers.					Washington time.										
	Monthly mean.			Highest.	Lowest.	Date.	Range.	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Washington time.			Total.	Miles.	Direction from—	Date.		
	7 p. m.	9 p. m.	11 p. m.															7 a. m.	9 p. m.	11 p. m.						
1883.																										
Jan.	29.807	29.785	29.811	29.801	30.379	22	29.844	30	1.035	29.4	35.7	31.7	32.3	35.6	27	7.0	21.49.0	30.7	24.3	2,298	2,333	2,421	7,052	38	NW., S.	10, 13
Feb.	29.923	29.884	29.902	29.903	30.389	18	29.823	24	1.065	35.1	42.0	39.4	38.8	37.4	15	12.0	5.62.0	46.3	30.7	2,385	2,342	2,061	6,788	36	S. W.	16, 24
Mar.	29.723	29.688	29.699	29.700	30.283	18	29.251	29	1.012	39.4	47.9	44.1	43.8	40.9	18	23.0	19.47.0	51.5	37.1	2,308	2,549	2,591	7,638	29	N.	22, 23
Apr.	29.694	29.558	29.564	29.572	30.973	8	29.007	22	.906	54.6	65.2	59.9	59.9	54.5	14	37.0	3.47.5	68.0	51.7	1,901	2,545	2,503	7,011	37	N.E.	28, 23
May.	29.630	29.604	29.606	29.613	30.949	6	29.277	14	.672	90.0	71.0	64.6	65.2	63.5	9	57.0	22.45.5	73.9	56.5	2,136	2,943	2,646	7,725	40	SW.	28, 23
June.	29.620	29.585	29.589	29.598	30.893	1	29.280	10	.618	71.5	82.3	73.8	75.9	91.0	17	57.0	1.34.0	83.5	67.8	1,393	1,979	1,917	5,289	44	E.	21
July.	29.706	29.679	29.683	29.689	30.977	18	29.859	12	.618	73.9	83.6	75.6	77.7	92.0	21	60.0	30.32.0	85.3	70.2	1,190	1,769	1,720	4,619	46	N.	16
Aug.	29.715	29.683	29.691	29.696	30.910	5	29.568	11	.342	69.6	81.3	73.4	74.8	82.5	23	61.0	30.31.5	82.6	67.2	1,098	1,573	1,414	4,085	27	N.E.	23
Sept.	29.714	29.670	29.677	29.687	30.923	9	29.516	24	.407	61.2	76.2	66.7	68.0	88.0	2	47.0	9.42.0	77.1	59.6	1,294	1,871	1,635	4,600	32	N.	21
Oct.	29.722	29.697	29.706	29.708	30.948	15	29.206	28	.842	53.8	65.3	59.6	60.2	85.0	8, 9	88.5	22.46.5	87.2	53.7	1,986	2,253	1,972	6,211	33	SW.	28
Nov.	29.831	29.783	29.798	29.804	30.860	16	29.246	21	1.104	44.9	55.3	49.9	50.0	73.5	9	15.3	16.68.2	58.5	42.4	2,159	2,331	2,107	6,597	40	SW.	21
Dec.	29.789	29.749	29.776	29.771	30.133	15	29.249	26	.884	37.5	47.3	41.6	42.1	71.0	1	13.8	19.57.2	51.2	33.9	2,013	2,250	2,331	6,594	35	NW., N.	16, 18
Sums.	355,774	356,356	356,492	356,542						632.9	752.8	680.8	688.7				784.8	595.1	22,311	26,778	25,210	74,299				
Means.	29.721	29.697	29.708	29.712	30.389	*18	29.007	123		52.7	62.7	56.7	57.4	92.5	22	7.0	\$21.	63.4	48.6	1,859	2,231	2,078	5,608			

\* February.

† April.

‡ August.

§ January.

Month.	Winds at 7 a.m., 8 and 11 p.m. Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths).		Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	Of inch or more of water.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
											7 a.m.	11 p.m.	Mean.	7 a.m.	11 p.m.	Mean.	7 a.m.	11 p.m.	Mean.	7 a.m.				11 p.m.		Mean.	7 a.m.	11 p.m.	Mean.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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NOTE.—7 a.m., 3 p.m., and 11 p.m., Washington time, correspond with 6.11 a.m., 2.11 p.m., and 10.11 p.m., local time.

Correction for instrumental error of barometer used: From 6.11 a.m., January 1, to 10.11 p.m., December 31, inclusive,  $\pm 0.040$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.420; February, 0.420; March, 0.420; April, 0.410; May, 0.400; June, 0.390; July, 0.380; August, 0.380; September, 0.400; October, 0.400; November, 0.420; December, 0.420.

WM. H. RAY,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CANBY, FORT, WASH.

[Latitude, 49° 10' N.; longitude, 124° 4' W. Magnetic variation, 22° E. Elevation of barometer above sea-level, 179 feet. Elevation of exposed thermometer above ground, 6.67 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.					Maximum hourly velocity during month.							
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Mean maximum.	Mean minimum.	Washington time.				Miles.	Direction from—	Date.		
	7 a. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.												
1883.	In.	In.	In.	In.	In.				In.	7 a. m.	3 p. m.	11 p. m.	o	o	o	o	o	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.					
Jan.	29.819	29.822	29.809	29.817	30.089	19	29.474	29	.615	57.6	62.9	59.5	60.0	86.4	21	48.5	19	37.9	66.5	55.1	2,150	2,448	2,454	7,052	56	S.	8
Feb.	29.822	29.848	29.845	29.835	30.169	9	29.119	25	1.050	49.7	52.9	50.7	51.1	100.2	3	40.2	27	20.0	55.2	46.9	2,307	2,483	2,463	7,307	47	S.E.	25
Mar.	29.822	29.848	29.845	29.835	30.169	11	29.347	24	.914	46.4	48.4	47.2	47.3	56.8	12	33.5	25	23.3	50.6	43.7	2,630	2,430	2,921	8,659	60	S.	26
Apr.	29.885	29.919	29.900	29.901	30.204	7	29.211	25	1.051	43.3	45.5	44.0	44.3	57.0	14	29.6	31	27.4	48.3	40.2	2,550	2,904	3,479	8,933	56	S.	26
May																											
June																											
July																											
Aug.																											
Sept.																											
Oct.																											
Nov.																											
Dec.																											
Sums.	29.878	29.884	29.888	29.883	30.262					43.3	45.5	44.0	44.3	57.0	14	29.6	31	27.4	48.3	40.2	2,550	2,904	3,479	8,933	56	S.	26
Means.																											
	Averages.																										

\* One 7 a. m., and one 3 p. m., observations missed.

[illegible]

One 7 a. m., one 3 p. m., observations missed.

NOTE.—7 a.m., 3 p. m., and 11 p. m. Washington time, correspond with 8.53 a. m., 11.52 a. m., and 7.52 p. m., local time.

Correction for instrumental error of barometer used: From 3.52 a. m., September 1, to 7.52 p. m., December 31, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: September, 0.200; October, 0.200; November, 0.280; December, 0.200.

**J. H. YOUNG,**

**Private, Signal Corps, U. S. A.**

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CAPE HENRY, VA.

[Latitude, 39° 59', N.; longitude, 76° 0' W. Magnetic variation, 30 4/5° W. Elevation of barometer above sea-level, 16 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 6 feet.]

Barometer (corrected for temperature and instrumental error only).												Temperature.					Wind.												
Month.	Washington time.			Monthly mean.		Highest.		Lowest.		Range.		Washington time.			Self-registering ther- mometers.			Washington time.				Total.		Miles.		Maximum hourly velocity during month.			
	7 p. m.	3 p. m.	11 p. m.	In.	In.	Date.	In.	Date.	In.	200	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	3 p. m. to 7 a. m.	8 p. m. to 11 p. m.	Miles.		Miles.	Direction from—	Date.
1883.																													
Jan .....	30.188	30.151	30.181	30.173	30.628	24.28	428	91	200	35.2	38.7	36.7	36.9	67.0	2120.0	°	°	2,804	2,832	2,978	8,614	52	N.	10					
Feb .....	30.298	30.250	30.271	30.273	30.729	22.28	813	7	916	42.9	49.2	43.6	45.2	778.0	1725.0	°	°	2,984	3,453	2,538	8,975	43	N.	25					
Mar .....	30.027	29.947	29.995	29.990	30.523	5.28	341	101	182	38.4	47.8	41.4	42.9	973.0	1912.0	°	°	3,922	4,098	3,833	11,853	52	NW.	15					
Apr .....	30.014	29.971	30.009	29.998	30.387	14.23	488	28	899	51.2	57.0	51.1	53.1	772.0	935.0	°	°	3,326	3,432	3,311	10,069	50	NW.	16					
May .....	30.922	29.947	29.967	29.969	30.304	18.28	359	21	945	60.5	68.3	62.0	63.9	972.0	946.0	°	°	3,058	3,009	2,692	8,769	44	NW.	16					
June .....	30.008	29.975	29.994	29.992	30.379	22.28	710	27	669	72.2	78.5	71.0	73.9	991.5	1960.0	°	°	2,152	2,559	2,408	7,114	42	NW.	27					
July .....	30.085	29.998	30.020	30.018	30.263	21.28	679	24	594	75.1	83.5	73.8	77.5	996.0	2365.0	°	°	2,191	2,516	2,048	6,750	46	N.	13					
Aug .....	30.081	30.005	30.027	30.021	30.198	14.28	745	2	438	73.0	81.0	72.6	75.5	992.0	1362.0	°	°	2,647	3,129	3,166	8,942	84	N.E.	28					
Sept .....	30.059	30.018	30.032	30.030	30.296	10.28	661	24	635	67.7	74.6	68.6	70.3	885.5	1359.0	°	°	3,746	3,711	3,634	11,091	58	N.E.	11					
Oct .....	30.137	30.068	30.121	30.119	30.543	17.28	563	2	950	60.8	65.4	61.7	62.5	989.0	248.0	°	°	4,081	4,077	3,864	12,022	44	NW.	23					
Nov .....	30.208	30.150	30.189	30.180	30.449	17.28	812	11	837	49.6	58.3	52.0	53.3	861.0	1026.0	°	°	3,717	3,721	3,166	10,604	49	NW.	13					
Dec .....	30.152	30.105	30.136	30.131	30.526	23.28	643	14	888	41.7	49.0	44.5	45.1	688.7	821.0	°	°	3,106	3,185	2,770	9,081	40	NW.	2, 15, 17					
Sums .....	361.149	360.615	360.893	360.900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37,734	39,722	35,898	118,354	.....	.....	.....				
Means .....	30.006	30.051	30.078	30.075	30.729	*2.28	341	110	.....	.....	.....	.....	.....	.....	.....	.....	.....	Averages.	Averages.	.....	.....	.....	.....	.....	.....	.....	.....	.....	

\* February.

† March.

‡ August.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	North.								Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent).				Number of days—					Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
											Total amount.		Date.		7 a. m.		8 p. m.		11 p. m.		Mean.								7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.		Fair.		Cloudy.		.01 inch or more of water.		Maximum below 32°.		Minimum below 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1888.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums	Percentages.	Mean.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.

**NOTE.**—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7.08 a. m., January 1, to 11.08 p. m., December 31, inclusive, + .008 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.110; February, 0.110; March, 0.100; April, 0.100; May, 0.100; June, 0.100; July, 0.100; August, 0.100; September, 0.100; October, 0.100; November, 0.100; December, 0.110.

**T. F. TOWNSEND,**  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

CAPE MAY, N. J.

[Latitude, 38° 56' N.; longitude, 74° 58' W. Magnetic variation, 4° 45' W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 6 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																									
	Washington time.			Monthly mean.			Highest.			Lowest.			Date.			Range.			Washington time.			Self-registering thermometers.			Washington time.			Mean maximum.			Mean minimum.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.		
	7 a. m.	3 p. m.	11 p. m.	In.	W.	W.	In.	W.	W.	In.	W.	W.	In.	W.	W.	In.	W.	W.	In.	W.	W.	Date.	Minimum.	Maximum.	Date.	Ab- solute range.	Mean maximum.	Mean minimum.	11 p. m.	7 a. m.	3 p. m.	Total.	Miles.	Direction	Date.							
1883.																																										
Jan.	30.170	30.128	30.150	30.149	30.745	24.28.15	29.28.15	10.1.187	1.187	31.7	33.5	33.3	33.3	33.3	33.3	11.0	27.38.0	2.738.0	40.7	27.5	3.624	3.419	3.613	10.886	46	NW.	23															
Feb.	30.332	30.233	30.245	30.249	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	21															
Mar.	30.367	30.268	30.267	30.267	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	11															
Apr.	30.441	30.345	30.354	30.354	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	26															
May	30.535	30.435	30.444	30.444	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	16															
June	30.635	30.535	30.544	30.544	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	8															
July	30.683	30.583	30.592	30.592	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	27															
Aug.	30.711	30.611	30.620	30.620	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	8															
Sept.	30.553	30.453	30.462	30.462	30.745	28.28.15	29.28.15	7.1.030	1.030	37.1	41.4	39.2	39.3	39.3	39.3	17.0	27.38.5	2.738.5	43.4	32.7	3.541	3.687	3.453	10.881	48	NW.	2															
Oct.	30.133	30.080	30.118	30.115	30.564	17.28.42	29.28.42	29.1.142	1.142	54.2	60.9	55.5	58.9	58.9	58.9	38.0	16.38.0	16.38.0	63.3	49.8	3.883	3.546	3.257	10.196	46	S.	29															
Nov.	30.155	30.110	30.123	30.120	30.908	17.28.42	29.28.42	29.1.142	1.142	54.2	60.9	55.5	58.9	58.9	58.9	38.0	16.38.0	16.38.0	63.3	49.8	3.883	3.546	3.257	10.196	46	S.	12															
Dec.	30.107	30.058	30.089	30.085	30.920	23.28.49	29.28.49	27.1.150	1.150	57.8	61.7	59.7	59.7	59.7	59.7	14.0	23.43.0	23.43.0	64.4	50.4	4.438	4.140	4.227	13.194	71	NW.	23															
Sums.	360.892	360.800	360.840	360.840	360.551	.....	.....	.....	.....	618.9	688.5	631.6	645.6	645.6	645.6	.....	.....	.....	721.9	569.1	42.631	42.162	43.537	198.830	.....	.....	.....	Averages.			.....	.....	.....	.....	.....	.....						
Means.	30.067	30.026	30.045	30.046	30.745	12.28.285	12.28.285	10.1.030	1.030	51.4	57.4	52.6	53.8	53.8	53.8	11.0	24.1.030	24.1.030	60.2	47.4	3.552	3.257	3.013	10.881	.....	.....	.....	Averages.			.....	.....	.....	.....	.....	.....						
* Direction not known.																														† February.			‡ March.			§ July.			January.			

\* Direction not known.

† February.

‡ March.

§ July.

|| January.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## CAPE MENDOCINO, CAL.

[Latitude, 40° 20' N.; longitude, 124° 24' W. Magnetic variation, 182 E. Elevation of barometer above sea-level, 687 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).					Temperature.					Wind.				
	Washington time.			Monthly mean.	Range.	Washington time.			Self registering thermometers.	Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.
	7 a. m.	3 p. m.	11 p. m.			7 a. m.	3 p. m.	11 p. m.				7 a. m. to 11 p. m.	3 p. m. to 7 a. m.	11 p. m. to 3 p. m.	
1883.	<i>T<sub>h</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>n</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>r</sub></i>	<i>T<sub>h</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>n</sub></i>	<i>T<sub>h</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>n</sub></i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Direction</i>
Jan.	29.542	29.544	29.524	29.537	29.704	29.524	29.525	29.524	31.0	30.5	30.5	3.239	3.308	3.530	76
Feb.	29.401	29.421	29.395	29.366	29.640	17.58	17.52	17.52	30.5	30.5	30.5	4.116	3.498	4.513	80
Mar.	29.273	29.296	29.278	29.282	29.500	15.28	15.27	15.27	30.5	30.5	30.5	3.223	3.238	4.238	80
Apr.	29.338	29.360	29.355	29.361	29.603	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
May	29.303	29.329	29.323	29.318	29.671	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
June	29.329	29.357	29.358	29.341	29.625	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
July	29.294	29.322	29.301	29.306	29.562	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
Aug.	29.325	29.352	29.341	29.339	29.459	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
Sept.	29.276	29.297	29.287	29.287	29.432	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
Oct.	29.327	29.348	29.333	29.336	29.432	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
Nov.	29.450	29.473	29.458	29.459	29.622	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
Dec.	29.421	29.428	29.423	29.424	29.671	15.28	15.27	15.27	30.5	30.5	30.5	3.237	3.434	3.946	100
Sums.	352.279	352.537	352.353	352.358	358.386	117.28	117.28	117.28	30.5	30.5	30.5	542.5	542.5	542.5	542.5
Means.	29.357	29.377	29.363	29.366	29.840	48.5	48.5	48.5	30.5	30.5	30.5	45.2	45.2	45.2	45.2

1 Eleven 7 a. m., nine 3 p. m., and nine 11 p. m. observations missed.  
 2 For 104 days.  
 3 Six 7 a. m. observations missed.  
 4 For 27 days.  
 5 Hurricane.  
 6 One 7 a. m. observation missed.  
 7 For 204 days.  
 8 For 204 days.  
 9 For 204 days.  
 10 For 204 days.  
 11 For 2 days.  
 12 For 2 days.  
 13 For 2 days.  
 14 For 2 days.  
 15 For 2 days.  
 16 For 2 days.  
 17 For 2 days.  
 18 For 2 days.  
 19 For 2 days.  
 20 For 2 days.  
 21 For 2 days.  
 22 For 2 days.  
 23 For 2 days.  
 24 For 2 days.  
 25 For 2 days.  
 26 For 2 days.  
 27 For 2 days.

[illegible]

Eleven 7 a. m., nine 3 p. m., and nine 11 p. m. observations missed.      •      Six 7 a. m. observations missed.      •      One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 3.50 a. m., 11.50 a. m., and 7.50 p. m., local time.

Correction for instrumental error of barometer used: From 3.50 a. m., January 1, to 7.50 p. m., December 31, inclusive,  $+0.41$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.700; February, 0.700; March, 0.690; April, 0.690; May, 0.680; June, 0.680; July, 0.680; August, 0.680; September, 0.680; October, 0.680; November, 0.690; December, 0.700.**

**A. P. LEAVITT,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CEDAR KEYS, FLA.

[Latitude, 29° 8' N.; longitude, 83° 2' W. Magnetic variation, 4° E. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Barometer (corrected for temperature and instrumental error only).																				Temperature.				Wind.					
Month.	Washington time.					Washington time.					Self-registering thermometers.				Washington time.				Maximum hourly velocity during month.										
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	Date.	Lowest.	Highest.	In.	Th.	U <sub>g</sub>	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Miles.	
1883.																													
Jan.	30.167	30.189	30.175	30.169	30.611	23.20	30.655	9	955	55.5	62.1	57.9	26	32.0	124.0	64.6	52.7	2.216	2.354	2.083	6.653	42	W.	9					
Feb.	30.240	30.203	30.237	30.227	30.521	29.30	30.628	23	533	63.4	71.2	66.1	16	43.0	28.38	72.0	62.0	1.796	1.909	1.553	5.258	23	N.E.	26					
Mar.	30.077	30.033	30.051	30.054	30.474	1.20	30.664	25	810	87.8	66.0	60.7	31	43.0	13.29	67.6	54.5	2.081	2.414	2.414	5.908	82	E.	24					
Apr.	30.038	30.065	30.069	30.084	30.191	3.20	30.698	23	493	70.1	78.7	71.1	14	55.0	26.31	78.5	68.6	2.401	2.507	2.213	7.121	71	S.	28					
May	30.032	30.067	30.067	30.065	30.171	25.20	30.647	21	524	72.4	80.1	72.9	17	50.0	28.37	81.2	68.1	2.275	2.877	2.344	6.968	30	N.W.	31					
June	30.050	30.013	30.052	30.082	30.167	5.20	30.659	25	308	70.9	86.6	79.7	18	70.8	28.29	83.2	76.1	2.219	2.847	2.444	7.010	34	N.	19					
July	30.111	30.078	30.094	30.094	30.269	23.20	30.715	13	307	81.7	88.3	81.5	6	69.4	20.23	90.8	77.9	2.174	2.948	2.302	6.524	42	N.	19					
Aug.	30.034	30.094	30.028	30.019	30.184	14.20	30.628	29	856	80.9	88.1	81.0	6	72.2	29.23	84.8	77.2	1.741	1.844	1.904	5.492	29	S.W.	7					
Sept.	30.016	30.073	30.013	30.001	30.196	23.20	30.505	21	391	74.7	85.8	78.5	7	65.5	26.24	87.0	72.6	1.701	1.768	1.630	5.099	28	S.	24					
Oct.	30.053	30.013	30.044	30.043	30.201	6.20	30.888	13	333	72.8	81.1	75.0	7	59.0	25.25	82.0	70.2	1.535	2.093	1.907	5.535	23	N.E.	18					
Nov.	30.167	30.108	30.138	30.143	30.391	16.20	30.962	25	399	61.4	71.6	64.3	11	43.3	28.9	72.8	58.1	1.908	2.055	1.799	5.757	28	N.	23					
Dec.	30.189	30.131	30.168	30.163	30.297	20.20	30.977	26	320	58.0	67.5	62.1	7	30.2	16.45	68.9	55.5	1.411	1.623	1.205	4.239	29	N.W.	15					
Sums.	361.135	300.687	361.002	360.926					838.1	928.1	850.8	868.3			944.0	791.5		23.486	23.145	23.868	72.529								
Means	30.095	30.063	30.084	30.077	30.611	+23.20	30.647	121		68.0	77.2	70.9	16	30.2	78.7	68.0		1.957	2.2	1.963	4.1	961.5							6 December
																													1 August
																													1 May
																													1 January

§ December.

\* August.

† May.

\* January.

Month.	Winds at 7 a. m., 3 p. m., and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—						Remarks.															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Total amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.								
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.					
1883.																																					
Jan.	8	22	11	10	27	5	4	6	0	0	4.6	5.9	4.6	5.0	59.4	54.3	52.5	82.6	81.2	8	15	8	11	0	0	0	0	0	0	0							
Feb.	8	17	14	13	10	7	5	10	0	0	3.6	7.9	2.8	3.4	57.0	57.0	58.4	76.9	74.5	17	16	9	1	0	0	0	0	0	0	0							
Mar.	8	16	9	9	23	16	15	14	1	0	4.0	4.3	2.7	3.9	60.9	51.4	51.9	79.3	71.9	14	11	6	4	0	0	0	0	0	0	0							
Apr.	8	11	9	9	23	16	7	6	1	0	4.1	4.9	2.3	3.8	63.9	64.1	65.0	81.6	71.9	18	4	8	10	0	0	0	0	0	0	0							
May	11	14	10	6	10	11	20	11	0	0	2.6	3.1	2.4	3.0	63.2	63.9	64.6	72.2	69.6	17	11	3	7	0	0	0	0	0	0	0							
June	8	12	9	5	12	19	27	3	0	0	2.6	3.1	3.0	4.5	73.5	73.6	73.4	80.2	75.6	4	24	2	11	0	0	0	0	0	0	0							
July	6	18	8	7	5	25	33	1	1	0	3.2	3.7	1.1	2.7	74.7	74.2	74.3	80.2	75.6	21	9	1	10	0	0	0	0	0	0	0							
Aug.	6	18	20	4	14	21	8	1	1	0	3.9	4.4	3.4	3.9	73.5	74.1	73.2	81.6	74.5	13	15	3	7	0	0	0	0	0	0	0							
Sept.	20	25	9	3	2	10	17	4	1	0	2.7	3.8	1.9	2.9	69.6	69.6	71.1	83.1	74.5	17	12	1	5	0	0	0	0	0	0	0							
Oct.	14	29	9	3	2	10	17	4	4	0	2.6	3.9	2.5	3.1	69.0	70.4	69.4	80.5	74.5	17	12	2	6	0	0	0	0	0	0	0							
Nov.	28	25	10	6	7	3	10	7	0	0	2.9	3.4	2.0	2.8	66.4	69.0	68.0	80.7	77.1	20	6	4	3	0	0	0	0	0	0	0							
Dec.	7	15	18	9	15	6	12	7	0	0	2.2	2.3	2.2	2.2	64.6	60.0	58.4	78.0	83.2	23	7	1	4	0	0	0	0	0	0	0							
Sums	128	211	137	74	141	135	184	72	13	33	44	248	730	41	757	773	1769	8938	9915	44	180	132	44	70	0	1	47										
											Percentages.										Percentages.																
Means.											11.7	10.3	12.5	8.7	12.9	12.3	16.8	6.1	1.2	3.7	4.1	2.5	3.4	63.2	64.4	64.1	63.9	82.4	80.6	79.8	35.1	32.6	12.1	21.6	0.0	3.12	9

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 6.36 a. m., January 1, to 10.36 p. m., December 31, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

GEO. W. DAVIS,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CHARLESTON, S. C.

*Latitude, 32° 47' N.; longitude, 79° 56' W. Magnetic variation, 1° 20' E. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 33 feet.*

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																			
	Washington time.					Monthly mean.					Washington time.		Self-registering ther- mometers.				Washington time.		Maximum hourly velocity during month.																	
	7 p. m.		3 p. m.		11 p. m.	In.		Lowest.		Date.	Range.		7 p. m.		3 p. m.		11 p. m.	Maximum.		Minimum.		Date.	Absolute range.		Mean maximum.		Mean minimum.		11 p. m. to 7 p. m. to 3 p. m. to 8 p. m. to		Total.		Miles.	Direction from—	Date.	
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
1883.																																				
Jan.....	30.139	30.102	30.141	30.127	30.616	23.23	518	9	1.068	48.1	55.2	51.0	51.4	60.0	6	25.0	12	44.0	57.8	45.1	1.577	1.764	1.588	24	W.	9, 10										
Feb. * ..	30.228	30.200	30.238	30.224	30.504	27.30	001	7	5.038	52.9	62.7	55.5	57.0	73.0	17	39.0	13	39.0	65.5	50.1	1.559	1.936	1.847	24	E. N.E.	12, 13										
Mar. * ..	30.014	29.953	29.970	29.979	30.397	1.23	580	20	.837	48.4	59.5	53.6	53.8	74.0	29	36.0	9	33.0	63.4	45.9	1.740	2.568	2.305	23	E.	25										
Apr.....	29.951	29.947	29.976	29.969	30.808	4.23	550	23	.753	61.1	67.9	63.0	64.0	81.5	17	45.0	3	36.5	71.6	53.5	1.895	2.614	2.119	23	N.W.	17										
May.....	29.985	29.837	29.933	29.890	30.299	13.23	429	21	.750	67.5	73.9	65.9	70.8	91.0	15	48.0	2	34.0	73.5	63.6	1.978	2.462	2.294	23	N.W.	1										
June.....	29.930	29.856	29.860	29.913	30.213	23.73	788	13	.474	73.3	84.9	77.8	80.3	94.0	21	74.0	2	34.0	80.0	73.7	1.498	2.176	2.115	23	N.E.	1, 14										
July.....	30.024	29.994	30.015	30.013	30.273	23.23	789	13	.894	51.0	68.5	59.6	63.4	101.0	17	71.0	30	31.0	82.1	70.6	1.416	2.101	2.127	23	N.W.	30										
Aug.....	29.937	29.853	29.973	29.973	30.180	14.23	773	23	.857	70.4	85.3	73.1	74.8	96.0	2	43.0	31	31.0	87.8	73.7	1.599	1.837	1.868	23	N.E.	7										
Sept.....	29.933	29.819	29.973	29.969	30.126	27.23	603	11	.591	70.6	78.3	72.9	74.8	90.0	2	43.0	11	32.0	81.4	68.5	1.510	2.209	2.065	23	N.E.	10										
Oct.....	30.049	30.010	30.042	30.034	30.350	17.23	745	12	.008	68.6	73.6	68.0	68.0	92.0	3	38.0	24	46.0	76.0	63.5	1.932	2.451	2.214	23	N.E.	4										
Nov.....	30.165	30.113	30.148	30.142	30.525	16.23	856	14	.669	54.9	65.2	58.1	58.4	90.0	10	30.0	17	50.0	66.8	52.1	1.662	2.120	1.697	23	N.	27										
Dec.....	30.127	30.079	30.120	30.107	30.318	7.23	735	14	.568	51.2	61.9	55.0	58.0	76.0	9	29.5	16	45.7	63.8	49.0	1.822	1.770	1.464	24	N.E.	4										
Sums.....	360.677	360.193	360.534	360.468	.....	.....	.....	.....	.....	755.9	852.9	782.5	793.3	.....	.....	804.7	720.3	19.088	26.156	23.672	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
Means.....	30.056	30.016	30.044	30.039	30.616	123.23	429	21	.....	63.0	71.7	65.2	66.6	101.0	17	35.0	12	.....	74.6	60.0	1.591	2.180	1.973	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		

\* One 11 p. m. observation missed.

† January.

‡ May.

§ July.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—										Rainfall or melted snow.		Washington time.						Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.		Mean.	Clear.	Fair.	Cloudy.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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1 One 11 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 6.49 a. m., 2.29 p. m., and 10.49 p. m., local time. Correction for instrumental error of barometer used: From 6.49 a. m., January 1, to 10.49 p. m., December 31, inclusive, —.028 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.060; February, 0.060; March, 0.060; April, 0.060; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.060; November, 0.060; December, 0.060.

J. H. SMITH,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CHARLOTTE, N. C.

[Latitude, 35° 13' N.; longitude, 80° 51' W. Magnetic variation, 1° 14' E. Elevation of barometer above sea-level, 808 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 47 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.									
	Washington time.					Washington time.					Self-registering thermometers.					Washington time.									
	Monthly mean.					Monthly mean.					Self-registering thermometers.					Washington time.									
	7 a. m.	3 p. m.	11 p. m.	High.	Low.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Maximum hourly velocity during month.	
1888.																									
Jan.	29.299	29.260	29.291	29.283	29.692	23.770	10.722	35.8	44.2	38.8	39.4	42.0	35.0	12.15.0	47.0	46.5	32.8	94.0	1.354	1.246	3.546	17	N. N.W.	21.23	
Feb.	29.436	29.402	29.417	29.418	29.742	29.076	17.066	44.1	34.1	47.9	48.5	47.6	30.2	17.30.0	27.4	57.9	40.3	1.134	1.547	1.193	3.874	20	N.E.	18.18	
Mar.	29.186	29.134	29.147	29.152	29.602	1.28.713	17.859	40.6	34.1	45.2	46.0	40.0	30.0	19.20.0	1	48.0	36.8	1.225	1.824	1.649	4.698	22	N.W.	15.15	
Apr.	29.180	29.128	29.147	29.155	29.423	1.28.713	21.824	32.8	30.9	36.2	39.2	36.2	34.0	23.40.0	9	48.0	36.8	1.204	1.824	1.859	4.031	20	S.	23.23	
May	29.191	29.128	29.147	29.155	29.423	1.28.713	21.824	32.8	30.9	36.2	39.2	36.2	34.0	23.40.0	9	48.0	36.8	1.204	1.824	1.859	4.031	20	S.	15.15	
June	29.209	29.154	29.188	29.184	29.458	2.28.972	21.824	32.8	30.9	36.2	39.2	36.2	34.0	23.40.0	9	48.0	36.8	1.204	1.824	1.859	4.031	20	N.W.	15.15	
July	29.259	29.208	29.224	29.224	29.476	2.28.972	21.824	32.8	30.9	36.2	39.2	36.2	34.0	23.40.0	9	48.0	36.8	1.204	1.824	1.859	4.031	20	N.W.	15.15	
Aug.	29.228	29.188	29.211	29.212	29.390	31.29.019	29.076	71.3	68.0	78.0	76.9	54.0	40.0	20.33.0	33.0	84.9	43.9	84.9	1.131	1.037	1.037	3.219	22	N.W.	24.24
Sept.	29.241	29.197	29.214	29.217	29.416	1.29.951	29.076	63.8	75.0	68.9	68.5	51.8	3.51.0	25.40.0	33.0	78.9	51.8	1.124	1.490	1.193	3.785	24	N.W.	11.11	
Oct.	29.207	29.250	29.285	29.284	29.648	17.28.867	29.076	57.8	67.0	60.2	61.0	63.5	2.44.0	22.33.0	33.0	82.4	53.1	1.124	1.490	1.193	3.785	24	N.W.	11.11	
Nov.	29.284	29.232	29.251	29.250	29.755	17.29.100	14.655	45.8	59.5	51.6	52.4	78.2	10.19.8	17.58.0	16.44.0	85.0	43.7	1.119	1.496	1.149	3.784	24	N.W.	13.13	
Dec.	29.311	29.278	29.304	29.298	29.578	7.28.867	27.691	42.0	62.7	43.1	46.0	66.6	2.22.6	16.44.0	16.44.0	85.0	39.2	917	1.222	983	3.102	25	W.	27.27	
Suma.	351.241	350.650	350.850	350.850	350.845	.....	.....	665.3	802.1	710.5	725.8	.....	.....	.....	.....	830.8	637.0	12.288	17.406	14.943	44.637	.....	.....	.....	
Means.	29.270	29.222	29.245	29.246	29.755	17.28.866	121.....	55.4	66.8	59.2	60.5	67.5	24.15.0	.....	.....	60.2	52.2	1.024	0.1	450.51	245.2	.....	.....	.....	
																								9 January	
																								9 May.	
																								9 November.	

† January.

‡ July.

† May.

\* November.

Month.	Winds at 7 a. m., 9 and 11 p. m., Washington time: Number of times observed blowing from—												Rainfall or melted snow.				Washington time.												Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Number of calms.												Total amount.	Any 3 consecutive hourly maxima.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Date.						7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.45 a. m., 2.45 p. m., and 10.45 p. m., local time. Corrections for instrumental errors, of barometer used: From 6.45 a. m., January 1, to 10.45 p. m., January 31, inclusive, — .006 inch; from 6.45 a. m., February 1, to 10.45 p. m., December 31, inclusive, — .005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.890; February, 0.890; March, 0.880; April, 0.860; May, 0.840; June, 0.830; July, 0.830; August, 0.830; September, 0.840; October, 0.860; November, 0.880; December, 0.880.

D. O'DONOGHUE,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CHATTANOOGA, TENN.

[Latitude, 35° 4' N.; longitude, 85° 15' W. Magnetic variation, 4° E. Elevation of barometer above sea-level, 763 feet. Elevation of exposed thermometer above ground, 43 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.																				
	Washington time.			Monthly means.			Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.																			
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.	Date.												
1883.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°												
Jan	29.372	28.318	28.357	28.340	28.848	10.504	22.28	28.944	10.504	41.5	41.0	27.14.0	12.51.0	49.9	34.1	1,504	1,573	4,654	25	S.	30	11	19	22	23	24	25	26	27	28	29	30	31		
Feb	29.469	28.436	28.469	28.458	28.857	7.719	27.28	28.138	7.719	48.8	48.3	49.3.74.0	15.16.27.5	57.5	41.2	1,511	1,918	5,179	28	SW., NW.	11	19	22	23	24	25	26	27	28	29	30	31			
Mar	29.266	28.297	28.344	28.239	28.600	1.28	7.60	28.780	31.891	48.4	49.3	37.8.0	30.28.0.16	20.48.0	50.1	40.0	1,581	2,073	5,008	27	NW.	11	19	22	23	24	25	26	27	28	29	30	31		
Apr	28.205	28.156	28.178	28.160	28.328	3.28	7.10	28.509	56.2	58.8	59.2	61.4.84.0	13.40.0	23.44.0	71.3	62.7	1,183	1,887	4,877	27	NW.	11	19	22	23	24	25	26	27	28	29	30	31		
May	28.240	28.184	28.214	28.218	28.437	6.28	7.23	28.720	50.7	74.7	73.6	9.42.5	22.44.5	77.7	66.1	1,034	1,817	4,549	31	SE.	11	19	22	23	24	25	26	27	28	29	30	31			
June	28.246	28.183	28.217	28.218	28.431	6.25	7.23	28.720	70.8	84.1	73.4	70.1.83.0	24.56.0	97.8	85.2	1,852	1,506	4,446	31	SE.	11	19	22	23	24	25	26	27	28	29	30	31			
July	28.316	28.263	28.287	28.289	28.546	22.28	7.41	28.041	12.565	78.2	87.5	78.2	4.22.62.0	11.35.0	90.4	69.5	747	1,576	3,767	30	NW.	11	19	22	23	24	25	26	27	28	29	30	31		
Aug.	28.384	28.240	28.269	28.264	28.417	31.28	12.28	28.298	28.298	60.0	81.6	72.7	74.4.93.0	21.60.5	31.32.5	84.6	67.0	600	1,304	3,057	20	SW., NW.	11	19	22	23	24	25	26	27	28	29	30	31	
Sept.	28.291	28.225	28.263	28.260	28.400	1.28	6.87	28.087	21.432	63.1	79.7	68.4	40.4.91.0	45.1.0	27.40.0	81.1	62.2	652	1,150	2,976	17	NW.	11	19	22	23	24	25	26	27	28	29	30	31	
Oct.	28.311	28.260	28.307	28.296	28.545	16.28	6.73	28.073	29.072	59.2	70.8	62.4	64.1.83.0	13.44.0	31.39.0	72.1	58.0	1,082	1,490	3,705	24	S.	11	19	22	23	24	25	26	27	28	29	30	31	
Nov.	28.432	28.367	28.405	28.400	28.832	16.28	11.0	28.110	9.722	45.4	59.2	50.6	51.7.78.0	9.17.0	18.50.0	61.0	43.1	1,062	1,558	4,006	23	N.	11	19	22	23	24	25	26	27	28	29	30	31	
Dec	28.357	28.331	28.361	28.350	28.604	10.28	6.68	28.068	27.066	41.7	51.8	43.0	46.2.66.0	1.0.22.0	16.44.0	54.4	37.4	1,221	1,496	4,260	32	NW.	11	19	22	23	24	25	26	27	28	29	30	31	
Sums.	351.790	351.190	351.571	351.523	.....	.....	.....	.....	.....	664.8	814.0	710.8	729.7	.....	345.7	628.1	13,018	19,948	13,124	50,500	Averages.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Means.	28.317	28.266	28.298	28.294	28.837	*27.28	7.19	1.22	.....	55.4	67.8	59.2	60.8	67.0	4.4	22.14.0	51.2	61.2	81.5	511.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

January.

July.

April.

February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—							Rainfall or melted snow.		Washington time.							Number of days—					Remarks.										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
										Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.
1888.																																
Jan.	4	14	3	9	17	11	15	18	2	3.312.96	20	6.9	6.4	6.6	31.1	32.9	32.9	72.1	64.4	75.3	72.9	7	8	16	16	0	12	6				
Feb.	9	19	6	4	21	8	4	12	0	2.341.98	4.5	7.5	6.1	6.1	33.5	33.3	33.3	76.5	63.0	70.8	70.1	6	7	15	16	0	4	6				
Mar.	9	8	6	9	19	22	14	18	0	4.965.25	23	6.0	5.7	5.6	42.0	41.8	43.6	68.5	44.7	59.3	53.2	11	10	18	13	0	5	9				
Apr.	7	8	13	19	16	9	12	9	3	2.552.55	20	6.3	4.1	4.1	52.5	52.0	53.7	77.4	50.7	70.2	64.1	7	15	18	13	0	6	7				
May	11	7	15	19	8	18	3	6	2	2.451.04	1	4.3	3.3	3.4	65.2	64.6	65.3	82.8	53.2	76.9	71.6	11	15	9	5	0	7	7				
June	8	9	12	15	17	10	17	6	2	2.261.98	13	4.5	3.8	3.9	82.8	82.8	83.2	82.8	53.2	76.9	71.6	9	18	9	5	0	7	7				
July	13	10	17	27	17	16	5	5	2	3.001.42	13	4.1	3.8	3.9	65.2	64.6	65.3	76.5	44.6	69.8	63.6	8	21	2	12	0	7	26				
Aug.	14	17	7	4	19	8	13	7	5	7.831.98	7	3.8	3.9	4.2	65.1	64.1	65.9	87.8	57.0	80.3	75.0	9	18	4	14	0	0	0				
Sept.	10	11	8	6	11	10	13	11	8	8.401.21	25	6.1	5.7	5.6	58.6	60.2	61.2	86.5	52.7	76.4	72.5	10	15	5	8	0	1	1				
Oct.	7	20	2	6	22	9	11	8	3	3.961.36	22	4.7	4.5	4.5	38.4	39.2	40.2	89.7	67.1	84.7	80.5	9	13	12	6	0	0	0				
Nov.	9	12	1	6	21	1	15	7	6	7.793.00	22	4.7	5.4	4.5	4.9	38.4	39.2	40.2	82.5	65.6	66.4	66.4	9	14	9	6	4	0	0			
Dec.	8	20	4	7	21	11	6	4	0	3.831.00	24	5.4	5.7	4.7	5.3	34.9	35.3	35.9	77.4	57.3	71.7	63.8	10	14	8	13	0	0	0			
Sums	109	161	48	76	176	182	113	181	52	54.16	63	0.72	0.52	0.52	2.568	1.592	3.692	7.594	3.968	1.653	9.831.1	106	161	98	137	0	32	30				
Means	Percentages.																															
	10.014	7.4	4.0	8.16	0.16	6.16	2.16	54.7			5.2	0.0	0.4	5.2	49.0	49.4	50.2	49.5	72.8	54.7	72.3	63.8	33.044	126	137	5	0	8	3.2			

NOTE.—7 a. m., 3 p. m. and 11 p. m., Washington time, correspond with 6.27 a. m., 2.27 p. m., and 10.27 p. m., local time. Corrections for instrumental errors of barometer used: From 6.27 a. m., January 1, to 10.27 p. m., July 31, inclusive, + 0.011 inch. From 6.27 a. m., August 1, to 10.27 p. m., December 31, inclusive, + 0.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.860; February, 0.860; March, 0.850; April, 0.830; May, 0.810; June, 0.810; July, 0.800; August, 0.800; September, 0.810; October, 0.830; November, 0.850; December, 0.860.

B. L. GOULDING,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

CHEYENNE, WYO.

[Latitude, 41° 8' N.; longitude, 104° 48' W. Magnetic variation, 15° 30' E. Elevation of barometer above sea-level, 6,105 feet. Elevation of exposed thermometer above ground, 51 feet. Elevation of rain-gauge above ground, 24 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.							
	Washington time.					Monthly mean.	Self-registering thermometers.					Washington time.					Maximum hourly velocity during month.						
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.		Lowest.	Date.	Range.	Monthly mean.	Maximum.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m.		3 p. m.	7 a. m.	3 p. m.	Total.	Miles.	Direction from—
1883.																							
Jan.	In. 23.853	In. 23.851	In. 23.889	In. 23.864	24.194	7 23.487	In. 23.487	12 23.487	In. 23.487	12 23.487	21 0.54.8	11 31.3	20 86.1	21 0.54.8	9 3	2 914	4 379	3 890	11.183	49	N.W.	29	
Feb.	In. 23.903	In. 23.971	In. 24.009	In. 23.968	24.436	26 23.363	In. 23.363	15 1.073	In. 23.363	26 23.363	21 0.54.8	28 18.9	55.0	28 18.9	55.0	1 524	1 739	1 940	7.438	38	W.	10	
Mar.	In. 23.975	In. 23.962	In. 23.975	In. 23.971	24.502	2 23.606	In. 23.606	30 0.986	In. 23.606	30 0.986	26 37.5	26 37.5	18 50.8	26 37.5	50.8	1 866	2 764	2 808	7.438	38	N.W.	20	
Apr.	In. 23.859	In. 23.865	In. 23.877	In. 23.864	24.380	24 23.107	In. 23.107	21 1.273	In. 23.107	21 1.273	30 37.1	30 37.1	15 51.6	30 37.1	49.1	1 918	2 643	2 743	7.304	40	N.W.	11	
May	In. 23.948	In. 23.938	In. 23.971	In. 23.952	24.290	20 23.413	In. 23.413	17 0.877	In. 23.413	17 0.877	46 36.2	46 36.2	25 45.9	46 36.2	60.5	1 828	3 222	3 222	8.108	48	N.W.	21	
June	In. 24.080	In. 24.087	In. 24.098	In. 24.078	24.277	29 23.746	In. 23.746	10 0.531	In. 23.746	10 0.531	57 59.0	57 59.0	30 73.3	57 59.0	45.7	1 175	2 069	2 169	5.440	28	N.W.	17	
July	In. 24.144	In. 24.128	In. 24.138	In. 24.137	24.295	21 23.864	In. 23.864	15 0.431	In. 23.864	15 0.431	63 0.90.2	63 0.90.2	30 73.3	63 0.90.2	43.4	1 162	1 789	1 893	8.844	27	W.	13	
Aug.	In. 24.170	In. 24.162	In. 24.182	In. 24.174	24.336	27 23.924	In. 23.924	21 0.412	In. 23.924	21 0.412	63 0.90.2	63 0.90.2	30 73.3	63 0.90.2	43.4	1 162	1 789	2 010	5.590	26	N.W.	21	
Sept.	In. 24.170	In. 24.146	In. 24.169	In. 24.162	24.380	20 23.902	In. 23.902	21 0.412	In. 23.902	21 0.412	63 0.90.2	63 0.90.2	30 73.3	63 0.90.2	43.4	1 412	2 168	2 010	5.590	48	N.W.	6	
Oct.	In. 23.966	In. 23.967	In. 23.967	In. 23.968	24.359	3 23.600	In. 23.600	28 0.759	In. 23.600	28 0.759	30 37.1	30 37.1	15 51.6	30 37.1	43.4	1 780	2 707	2 504	6.991	48	N.W.	20	
Nov.	In. 23.970	In. 23.967	In. 23.965	In. 23.974	24.390	11 23.509	In. 23.509	25 0.881	In. 23.509	25 0.881	38 2.06.1	38 2.06.1	20 16.2	38 2.06.1	51.0	1 878	2 621	2 441	6.940	40	N.W.	25	
Dec.	In. 23.958	In. 23.958	In. 23.989	In. 23.968	24.379	14 23.480	In. 23.480	25 0.890	In. 23.480	25 0.890	20 16.2	20 16.2	31 71.0	20 16.2	40.5	2 660	2 848	2 406	7.914	52	N.W.	17	
Sums.	288.094	287.949	288.257	288.100		417.1	626.0	483.0	508.6		674.8	374.9	21.440	30.777	20.853	82.100							
Means.	24.008	23.966	24.021	24.008	24.580	*20 23.107					42.4	494.2	31.2	42.4	494.2	31.2	1,786.7	2,564.2	2,490.2				

§ January.

† July.

† April.

\* September.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; number of times observed blowing from—								Rainfall or melted snow.		Washington time.				Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.				Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Percentages.

Three 7 a. m.; one 3 p. m.; two 11 p. m., observations missed.

Two 7 a. m.; three 3 p. m.; one 11 p. m., observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.09 a. m., 1.09 p. m., and 9.09 p. m., local time.

Correction for instrumental error of barometer used: From 5.09 a. m., January 1, to 9.09 p. m., December 31, inclusive, .00 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.270; February, 6.270; March, 6.200; April, 6.020; May, 5.890; June, 5.760; July, 5.710; August, 5.720; September, 5.880; October, 6.040; November, 6.230; December, 6.300.

EDGAR MCGOVERN,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

**CHICAGO, ILL.**

[Latitude, 41° 52' N.; longitude, 87° 38' W. Magnetic variation, 5° E. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 93 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.				Maximum hourly velocity during month.								
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Washington time.				Miles.	Direction from—	Date.				
	7 a. m.	3 p. m.	11 p. m.						Maximum.	Date.	Minimum.	Date.	Abolutive range.	Mean maximum.	Mean minimum.	11 p. m. to	7 a. m. to	3 p. m. to	11 p. m. to				Total.			
1883.																										
Jan	29.390	29.371	29.309	29.387	29.846	29.28.676	10 1.170	14.6	19.1	15.2	16.3	39.9	13	-17.2	22	57.1	24.8	8.0	2,113	2,405	2,632	7,140	27	SW.	13	
Feb	29.529	29.496	29.502	29.509	29.908	18.28.897	14 1.111	18.4	27.3	23.2	23.0	57.0	16	-8.8	1	65.8	30.5	14.7	1,880	1,902	2,007	5,789	24	SW.	19	
Mar	29.320	29.302	29.317	29.313	29.804	7.28.754	10 1.050	28.1	34.7	31.5	31.4	61.6	14	10.2	7	51.4	39.3	24.8	1,818	1,873	2,313	6,704	28	NE.	18	
Apr	29.243	29.223	29.224	29.229	29.543	2.28.716	10 1.827	42.1	48.9	45.9	45.6	78.3	14	28.3	1	50.0	54.2	39.6	2,260	2,603	2,465	7,328	33	NE.	22	
May	29.234	29.215	29.224	29.224	29.580	9.28.784	14 1.806	50.1	55.3	51.0	52.1	80.1	18	35.9	21	44.2	60.5	45.4	1,931	2,401	2,373	6,705	32	S.	18	
June	29.225	29.207	29.206	29.213	29.600	1.28.898	10 1.762	61.7	67.6	63.6	64.1	83.8	16	47.8	10	36.0	71.2	57.8	1,061	2,259	2,052	5,972	25	W.	19	
July	29.292	29.277	29.278	29.282	29.594	18.28.951	12 1.943	66.9	72.6	68.7	69.1	91.0	3	80.9	9	40.1	78.9	62.4	1,542	2,312	2,047	5,901	21	SW.	16	
Aug	29.376	29.355	29.368	29.363	29.621	6.29.090	19 1.531	64.6	72.6	67.6	68.3	89.0	19	54.5	4	34.5	74.0	61.7	1,087	1,822	1,599	4,508	20	W., SW.	22	
Sept	29.379	29.345	29.362	29.362	29.781	9.28.909	24 1.872	56.9	64.7	60.5	60.7	83.5	15	42.0	26	41.5	66.5	54.5	1,314	1,821	1,648	4,783	21	N.	16	
Oct	29.392	29.374	29.393	29.386	29.874	16.28.734	29 1.105	49.0	54.5	51.8	51.8	78.5	8	38.0	21	40.5	57.8	46.8	1,825	2,149	1,951	5,925	21	E., NE., W.	17	
Nov	29.368	29.339	29.348	29.350	29.910	16.28.855	9 1.055	37.1	45.7	41.7	41.5	62.0	4	21	10.0	16	52.0	49.9	34.4	1,967	2,320	2,182	6,440	26	W., NW.	25
Dec	29.342	29.340	29.365	29.349	29.755	22.28.769	17 1.986	26.7	33.8	29.9	30.1	57.0	7	0.5	19	56.5	38.5	23.4	1,890	2,253	1,862	5,945	26	NW.	27	
Sums	352.090	351.844	351.969	351.967				516.2	600.4	551.2	555.9						646.2	473.5		21,228	26,820	26,092	74,140			
Means.	29.341	29.320	29.331	29.331	29.908	118.28.676	110	43.0	50.0	45.9	46.3	91.0	\$3	-17.2	122		53.8	39.5	1,769.0	2,235.0	2,174.3					
																				Averages.						

\* One 7 a. m. observation missed.

February.

**January.**

**& July.**

### REPORT OF THE CHIEF SIGNAL OFFICER.

461

Month.	Winds at 7 a. m. 9 and 11 p. m., at times observed blowing from—								Number of calms.		Rainfall or melted snow.		Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
													Cloudiness (in tenths).		Dew-point.				Relative humidity (per cent.).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Total amount.												Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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One 7 a. m. observation missed.

Two 7 a. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.18 a. m., 2.18 p. m., and 10.18 p. m., local time.

Correction for instrumental error of barometer used: From 6.18 a. m., January 1, to 10.18 p. m., December 31, inclusive,  $-0.001$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.750; February, 0.750; March, 0.740;

**WILLIAM NORRINGTON.**

**WILLIAM MORRINGTON**  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CHINCOTEAGUE, VA.

[Latitude, 37° 55' N.; longitude, 75° 23' W. Magnetic variation, 3° 30' W. Elevation of barometer above sea-level, 18 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 28 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.					Monthly mean.	Self-registering thermometers.					Washington time.					Washington time.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.	Highest.	Lowest.		Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Total.	Miles.		Direction	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
									7 a. m.	3 p. m.	11 p. m.	Mon. by mean.	Maximum.	Minimum.			Date.	Absolute range.	7 a. m. to 7 a. m.						3 p. m. to 3 p. m.	11 p. m. to 11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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• February.

† March.

; July.

6 January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—				Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Date.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Fog.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Maximum above 90°.	
										Largest amount.	In.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.								
																																Any 3 consecutive hours.
1883.																																
Jan.....	29	23	2	5	11	7	4	12	0	4.14	1.08	20	6.3	7.2	6.8	6.8	28.3	31.0	29.0	29.6	87.4	83.2	86.7	85.8	0	0	0					
Feb.....	12	12	14	4	19	6	3	13	1	2.53	.86	24	5.0	5.9	5.2	5.4	30.4	33.5	33.1	32.3	76.4	68.0	80.1	74.8	20	0	0					
Mar.....	20	11	10	5	14	5	7	20	1	2.67	1.07	10	4.3	5.2	3.6	4.4	27.0	30.9	30.9	29.6	72.2	64.9	76.1	71.1	10	16	0					
Apr.....	11	18	18	13	24	6	2	11	0	2.77	.84	10	11	5.8	6.1	4.9	5.4	42.0	43.7	42.7	42.8	83.1	73.4	85.6	80.7	10	13	0				
May.....	7	18	10	11	28	6	2	11	0	1.90	.85	11	5.8	6.1	3.4	4.7	51.4	54.0	52.6	52.7	81.1	70.5	84.3	78.6	0	0	0					
June.....	3	1	12	21	40	5	4	4	0	1.26	.34	29	3.8	3.7	2.9	3.5	65.7	64.9	65.5	68.4	83.4	75.5	90.6	84.8	0	0	0					
July.....	9	5	5	7	39	8	6	13	1	5.82	1.19	15	3.8	3.7	2.9	3.5	65.0	64.6	65.0	64.9	82.8	68.3	85.8	79.0	0	0	0					
Aug.....	14	19	16	8	22	6	3	5	0	7.43	.35	20	4.2	4.2	3.0	3.8	65.0	64.6	65.0	64.9	82.8	68.3	85.8	79.0	0	0	0					
Sept.....	8	23	10	5	21	11	2	10	0	4.05	2.12	11	6.8	5.9	4.1	5.0	61.5	62.1	61.4	61.7	88.4	75.8	84.5	82.9	0	0	0					
Oct.....	22	21	8	11	12	4	2	10	3	6.65	3.10	22	5.9	6.8	4.5	5.7	52.4	52.2	52.5	52.5	87.3	75.2	82.7	81.7	0	0	0					
Nov.....	19	9	3	5	24	8	3	17	2	1.21	.52	26	3.8	5.0	3.0	3.9	39.6	42.4	41.8	41.3	79.4	68.4	78.7	75.8	11	14	0					
Dec.....	16	7	3	4	9	19	9	23	3	1.92	.52	23	5.8	4.5	4.1	4.8	38.2	34.9	34.2	34.1	88.0	72.5	79.6	78.4	10	12	0					
Sums...	170	167	101	99	263	89	48	147	11	42.35	.....	61	3.63	9.48	7.57	9.565	6.584	1.576	5.575	5.994	6.866	9.1	1004	4.955	3	114	172	79	135	6	63	4
Means...	Percentages.																															
	15.5	15.39	29.29	08.14	4.13	4.10	.....	5.1	5.3	4.1	4.8	47.1	48.7	48.0	47.9	82.9	72.2	83.7	79.6	31.2	47.1	121.6	37.0	1.617	31.1	.....	.....	.....	.....	.....	.....	.....

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.07 a. m., 3.07 p. m., and 11.07 p. m., local time. Correction for instrumental error of barometer used: From 7.07 a. m., January 1, to 11.07 p. m., December 31, inclusive, —0.013 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

CHAS. F. DICKENS,  
Private, Signal Corps, U. S. A.



Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Number of calms.								Any 3 con- secutive 8 hourly measure- ments.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.30 a. m., 2.30 p. m., and 10.30 p. m., local time.

Correction for instrumental error of barometer used: From 0.30 a. m., January 1, to 10.30 p. m., December 31, inclusive, .002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.680; February, 0.680; March, 0.680; April, 0.670; May 0.650; June, 0.650; July, 0.640; August, 0.640; September, 0.660; October, 0.660; November, 0.690; December, 0.700.

L. DUNNE,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CLEVELAND, OHIO.

[Latitude, 41° 20' N.; longitude, 81° 42' W. Magnetic variation, 9° 30' W. Elevation of barometer above sea-level, 600 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 73 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	In.	In.	In.								In.	In.	In.																In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Jan .....	29.382	29.344	29.359	29.362	29.778	29.28	29.767	20	1.011	19.4	25.1	21.4	22.0	62.0	30	5.0	22	57.0	29.8	14.4	22	57.0	29.8	14.4	22	57.0	29.8	14.4	22	57.0	29.8	14.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
Feb .....	29.478	29.444	29.443	29.455	29.880	29.28	29.970	6	.910	24.4	30.1	27.9	27.5	72.0	16	5.0	16	67.0	36.2	19.1	2	172	2,474	2,634	2,478	7,584	38	W.	23	16	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21</

\* February.

† October.

‡ August.

§ January.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond with 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

Correction for instrumental error of barometer used: From 6.41 a. m., January 1, to 10.41 p. m. December 31, inclusive,  $-.004$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.760; March, 0.780; April, 0.760; May, 0.730; June, 0.730; July, 0.720; August, 0.720; September, 0.720; October, 0.740; November, 0.770; December, 0.790.

**WILLIAM LINE,**  
*Sergeant, Signal Corps, U.S.A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

COLUMBUS, OHIO.

[Latitude, 39° 58' N.; longitude, 83° W. Magnetic variation, 1° 19' E. Elevation of barometer above sea-level, 805 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 70 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Washington time.			Total.	Miles.	Direction from —																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 a. m.	8 p. m.	11 p. m.						7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Mean maximum.	Mean minimum.	7 a. m.	8 p. m.	11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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\* November.

† October.

‡ July.

§ January.

Month.	Winds at 7 a. m., 9 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—					Remarks.											
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 8 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Minimum below 32°.	Maximum below 32°.	Maximum above 80°.					
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.	Mean.			
																															7 a. m.	8 p. m.	11 p. m.
1882.																																	
Jan.....	0	11	10	6	13	13	20	8	0	3 20 0 80	8 7	7 6	7 6	8 0	17 1	20 3	18 8	18 7	76 3	67 9	72 9	72 3	2	9	20	17	26	0					
Feb.....	2	3	9	7	12	14	22	15	0	6 18 1 42	7 2	7 5	6 9	7 1	24 8	25 0	27 6	25 8	79 2	61 8	73 0	72 3	2	12	14	15	23	0					
Mar.....	6	12	6	4	14	20	13	18	0	2 30 1 50	6 1	6 7	5 9	6 2	24 2	23 5	24 8	24 8	76 2	53 5	68 0	65 9	6	16	12	15	24	0					
Apr.....	6	18	9	10	11	14	11	11	0	2 35 0 72	4 9	6 8	4 8	5 5	35 7	33 6	38 1	36 8	71 0	50 9	64 5	62 2	10	18	12	12	0	0			Last frost April 25.		
May.....	8	2	7	21	13	24	6	4	0	6 38 1 74	5 9	6 7	4 2	5 6	44 0	45 3	48 3	45 3	70 6	50 5	63 5	63 2	7	13	11	16	0	0					
June.....	8	2	4	9	22	24	6	14	0	4 37 1 11	5 4	6 3	3 6	5 1	57 6	58 2	53 7	53 3	78 2	55 2	73 9	68 8	8	13	4	13	0	0					
July.....	9	1	1	5	8	14	16	21	0	3 75 1 22	3 7	4 8	2 6	4 1	60 0	58 5	51 8	60 1	77 5	47 5	71 1	65 4	13	14	4	13	0	0					
Aug.....	13	12	4	4	14	19	16	21	0	2 54 1 40	3 7	4 8	2 6	4 1	50 0	58 5	54 9	54 9	77 5	44 0	63 5	62 7	16	10	5	11	0	0			First frost September 9.		
Sept.....	13	13	9	11	9	12	7	17	0	2 43 0 95	3 7	4 8	2 6	4 1	48 8	48 2	51 5	50 2	80 3	47 3	71 9	66 2	9	19	12	0	0	0			First killing frost November 2.		
Oct.....	15	13	9	11	9	12	7	17	0	6 11 2 17	29	6 8	7 4	7 0	45 5	44 1	45 1	45 1	82 6	58 5	74 9	72 0	6	9	17	13	0	0					
Nov.....	5	4	4	15	28	11	17	10	0	3 87 1 48	21	5 2	5 9	4 7	32 1	32 0	32 7	32 8	75 4	52 6	67 0	65 0	7	14	9	10	0	0					
Dec.....	6	4	5	8	28	15	17	10	0	4 12 1 63	23	24	5 8	7 3	25 3	25 0	26 8	25 7	78 3	60 4	74 2	71 0	5	10	16	17	3	20	0				
Sums..	100	92	72	96	237	175	174	149	0	45 88	68 2	78 2	80 1	68 8	8470	8 471	8 683	8 477	7 822	6 650	1 844	9 806	4	90	142	133	167	27	104	6			
Means.	Percentages.											5 7	6 5	5 0	5 7	39 2	39 3	40 8	39 8	76 8	54 2	70 6	67 2	24	733	9 36	4 45	8	7	433	5	1	

NOTE.—7 a. m., 9 p. m., and 11 p. m., Washington time, correspond with 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time. Correction for instrumental error of barometer used: From 6.36 a. m., January 1, to 10.36 p. m., December 31, inclusive, —.005 inch. The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.000; February, 0.000; March, 0.000; April, 0.010; May, 0.040; June, 0.040; July, 0.030; August, 0.030; September, 0.040; October, 0.030; November, 0.030; December, 0.010.

D. CUTHBERTSON,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

CONCHO, FORT, TEX.

[Latitude, 31° 26' N.; longitude, 100° 34' W. Magnetic variation, 10° 49' E. Elevation of barometer above sea-level, 1,900 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 3 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.										
	Washington time.			Monthly mean.			Highest.			Lowest.			Self-registering thermometers.			Mean maximum.			Mean minimum.			Washington time.			Maximum hourly velocity during month.		
	7 p. m.	3 p. m.	11 p. m.	W.	D.	R.	W.	D.	R.	W.	D.	R.	W.	D.	R.	W.	D.	R.	W.	D.	R.	W.	D.	Miles.	Direction from—	Date.	
1883.																											
Jan.....	28.221	28.179	28.192	28.197	28.528	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3	22.27	48.3
Feb.....	28.276	28.255	28.276	28.260	28.748	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4	15.1	64.4
Mar.....	28.141	28.102	28.120	28.121	28.546	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2	24.8	81.2
Apr.....	27.023	27.094	27.090	28.005	28.557	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1	20.1	07.1
May.....	28.060	28.041	28.038	28.045	28.267	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2	10.4	77.2
June.....	28.078	28.050	28.038	28.053	28.212	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5	8.4	85.5
July.....	28.168	28.137	28.127	28.142	28.365	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1	19.27	94.1
Aug.....	28.165	28.134	28.137	28.145	28.901	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2	11.3	84.2
Sept.....	28.188	28.162	28.170	28.173	28.984	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4	21.27	94.4
Oct.....	28.118	28.080	28.113	28.107	28.468	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7	31.27	89.7
Nov.....	28.232	28.199	28.223	28.218	28.684	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9	12.27	83.9
Dec.....	28.247	28.206	28.256	28.236	28.742	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3	17.27	85.3
Sums.....	337.907	337.549	337.676	337.710	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means.	28.156	28.126	28.140	28.143	28.748	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0	*17.27	89.0

• February.

† April.

‡ August.

§ January.

|| Thirty days.

B.—Elevation determined by barometer.

\* February.

† April.

‡ August.

§ January.

|| Thirty days.

B.—Elevation determined by barometer.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—						Remarks.						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								11 p. m.	Mean.	
1893.									Total amount.	Date.																				
Jan.....	16	4	0	2	12	20	9	8	18.06	23	4.5	3.1	1.8	3.1	22.5	27.1	27.2	25.6	73.3	40.7	64.9	59.6	19	10	5	5	2	17	0	
Feb.....	22	14	4	4	11	4	2	2	1.20	23	6.5	6.7	6.1	6.4	30.9	34.2	35.0	31.4	78.2	57.1	72.6	60.3	5	10	13	9	2	10	0	
Mar.....	12	14	8	10	19	11	7	3	4.99	16	6.1	5.9	4.1	5.4	42.3	43.1	45.6	43.7	86.0	50.4	73.5	70.0	10	9	12	11	0	1	0	
Apr.....	6	15	8	4	25	9	10	9	12.12	21	4.6	3.3	2.6	3.5	42.3	42.6	44.1	43.0	69.6	33.6	55.2	52.8	11	14	5	1	0	0	3	
May.....	8	13	8	6	33	4	8	3	6.35	18	4.3	4.1	2.6	4.3	35.5	37.7	37.7	35.9	82.1	42.7	61.9	61.2	11	13	7	6	0	0	11	
June.....	1	13	4	24	36	0	4	0	1.32	30	3.3	3.8	2.6	4.0	63.0	63.0	63.8	63.8	81.5	40.1	61.9	61.2	12	12	6	4	0	0	24	
July.....	0	19	7	10	51	4	1	1	7.8	31	3.8	5.7	2.4	4.0	63.0	63.0	63.8	63.8	81.5	40.1	61.9	61.2	12	12	6	4	0	0	27	
Aug.....	1	9	2	10	51	4	1	1	22.23	48	2.8	5.2	2.8	3.6	63.0	63.0	63.8	63.8	81.5	40.1	61.9	61.2	12	12	6	4	0	0	28	
Sept.....	3	18	4	12	20	9	4	4	3.05	53	4.6	5.1	4.1	4.7	57.2	59.7	60.1	59.0	78.3	33.0	51.8	54.4	12	16	8	4	0	0	8	
Oct.....	4	22	7	7	27	5	6	3	8.02	95	7.7	6.4	5.2	6.4	50.3	59.6	58.8	58.2	89.1	64.9	83.3	79.1	4	13	14	11	0	0	2	
Nov.....	8	12	6	4	27	13	10	1	11.12	18	5.8	5.2	3.6	4.9	41.9	42.9	44.0	42.9	80.9	47.6	73.9	67.5	10	13	7	5	0	0	9	
Dec.....	10	14	6	0	19	11	4	8	12.13	4	4.6	3.2	2.6	3.5	36.7	38.6	38.6	38.0	85.7	51.5	78.5	71.9	15	10	6	5	0	0	0	
Sums ..	91	167	59	92	314	92	67	88	62.87	940	5.3	5.73	3.59	4.597	3.599	3.597	3.590	6.812	8.777	2	130	147	88	78	5	40	103			
	Percentages.																													
Means	8.315	216.418	428.78	4	6.13	5.16	0	0	.....	.....	5.2	4.8	3.4	4.5	48.3	49.8	49.1	48.0	74.5	45.9	67.7	64.8	835	640	324	121	4	1.410	9.28	2

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.27 a. m., 1.27 p. m., and 9.27 p. m.

Correction for instrumental error of barometer used: From 5.27 a. m., January 1, to 9.27 p. m., December 31, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.020; February, 2.020; March, 1.970; April, 1.940; May, 1.900; June, 1.870; July, 1.880; August, 1.860; September, 1.900; October, 1.950; November, 2.010; December, 2.020.

C. E. KING,  
Frisco, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## OUSTER, PORT, MONT.

[Latitude, 48° 45' N.; longitude, 10° 34' W. Magnetic variation, 19° 40' E. Elevation of barometer above sea-level, 3,040 (2) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 22 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.						Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Washington time.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
																7 a. m.	3 p. m.		11 p. m.	Monthly mean.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	Total.	Miles.	Direction	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1883.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	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B.—Elevation determined by barometer.

Seven days.

Month.	Winds at 7 a. m., 3 and 11 p. m., at Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington.								Number of days—					Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Any 3 consecutive 8 hourly measurements.		Total amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.		
									7 a. m.	3 p. m.			11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										
1883.																																
Jan.	5	6	3	10	0	2	2	5	1	22	16	22	3	6	3.6	45.6	49.3	49.5	48.1	60.7	34.5	51.1	48.8	4	5	2	3	0	0	6	Station opened July 21.	
Feb.	11	12	23	15	6	6	9	0	1.01	66	11	25	3.7	2.7	3.0	42.5	46.3	45.7	54.2	31.2	48.7	44.7	17	11	3	4	0	0	15			
Mar.	19	23	21	7	6	3	5	6	0	.46	41	12	13	1.4	2.2	1.3	1.6	35.1	44.4	44.9	41.5	68.9	39.4	60.4	56.2	7	0	3	0	4	5	
Apr.	12	18	7	14	4	3	16	22	2	.97	28	9	6.9	7.5	5.9	6.8	26.5	35.5	35.8	32.6	77.8	58.0	76.5	70.8	4	11	16	13	0	15	0	
May	21	18	7	14	5	2	14	14	0	1.10	39	19	5.9	7.1	3.9	5.6	17.4	23.9	22.4	21.2	76.8	53.0	72.8	67.5	4	19	7	8	4	24	0	
June	16	7	6	17	7	7	15	13	5	1.87	57	25	28	5	7	2	3	5	16.1	17.9	78.8	64.4	74.2	72.5	8	13	10	11	8	29	0	
July	5	6	3	10	0	2	2	5	1	22	16	22	3	6	3.6	45.6	49.3	49.5	48.1	60.7	34.5	51.1	48.8	4	5	2	3	0	0	6	Station opened July 21.	
Aug.	11	12	23	15	6	6	9	0	1.01	66	11	25	3.7	2.7	3.0	42.5	46.3	45.7	54.2	31.2	48.7	44.7	17	11	3	4	0	0	15			
Sept.	19	23	21	7	6	3	5	6	0	.46	41	12	13	1.4	2.2	1.3	1.6	35.1	44.4	44.9	41.5	68.9	39.4	60.4	56.2	7	0	3	0	4	5	
Oct.	12	18	7	14	4	3	16	22	2	.97	28	9	6.9	7.5	5.9	6.8	26.5	35.5	35.8	32.6	77.8	58.0	76.5	70.8	4	11	16	13	0	15	0	
Nov.	21	18	7	14	5	2	14	14	0	1.10	39	19	5.9	7.1	3.9	5.6	17.4	23.9	22.4	21.2	76.8	53.0	72.8	67.5	4	19	7	8	4	24	0	
Dec.	16	7	6	17	7	7	15	13	5	1.87	57	25	28	5	7	2	3	5	16.1	17.9	78.8	64.4	74.2	72.5	8	13	10	11	8	29	0	
Suns.	Percentage.								Percentage.								Percentage.								Percentage.							
Means.	Percentage.								Percentage.								Percentage.								Percentage.							

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, corresponds with 4.53 a. m., 12.53 p. m., and 8.53 p. m., local time. Correction for instrumental error of barometer used: From 4.38 a. m., July 21, to 8.38 p. m., December 31, inclusive,  $\pm 0.07$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: July, 3.020; August, 3.000; September, 3.120; October, 3.240; November, 3.320; December, 3.400.

THOS. GIBSON  
Corporal, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## DAVENPORT, IOWA.

[Latitude, 41° 30' N.; longitude, 90° 38' W. Magnetic variation, 7° 30' E. Elevation of barometer above sea-level, 615 feet. Elevation of exposed thermometer above ground, 46 feet. Elevation of rain-gauge above ground, 77 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.						
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	1 p. m.						Date.	Maximum.	Minimum.	Date.	Δ between range.	11 p. m.	8 p. m.	7 a. m.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total Miles.
1883.																						
Jan.	29.469	29.457	29.477	29.468	29.556	29.238	29.238	30.1130	11.0	19.1	16.4	15.545	7.13	-23.0	22.68	7.24	1.918	2.654	2.518	32	S. W.	12.30
Feb.	29.500	29.579	29.593	29.567	29.688	17.28	873	16.1215	18.7	28.9	25.6	24.433	7.16	-14.0	5.67	7.33	1.717	2.006	2.030	32	W.	16.16
Mar.	29.590	29.575	29.598	29.586	29.694	3.28	810	18.1128	20.5	40.0	24.0	24.762	7.14	3.0	7.50	7.43	2.036	2.706	2.651	33	N. E.	18.13
Apr.	29.261	29.227	29.248	29.245	29.337	2.28	759	10.578	44.8	59.0	51.3	51.730	2.18	26.0	1.54	2.62	2.347	2.874	2.640	32	S.	14.14
May	29.265	29.249	29.262	29.259	29.350	11.23	754	14.578	52.5	62.5	55.0	57.031	2.18	23.0	21.48	2.65	2.141	2.868	2.768	30	S. W.	18.18
June	29.268	29.253	29.252	29.258	29.367	1.28	977	11.598	63.4	78.6	68.0	68.392	2.26	49.0	26.43	78.1	1.460	2.409	2.108	30	S. W.	15.15
July	29.343	29.326	29.320	29.330	29.406	18.29	008	12.688	68.5	86.8	72.4	73.792	2.0	52.0	8.40	82.0	1.690	2.297	2.276	30	S. W.	20.20
Aug.	29.420	29.400	29.405	29.408	29.662	6.29	100	21.562	63.6	76.6	69.1	69.898	2.19	49.0	23.39	74.1	1.283	1.991	1.895	24	S. W.	18.18
Sept.	29.414	29.391	29.415	29.407	29.777	9.29	015	24.762	53.7	69.7	59.8	60.985	7.1	38.0	9.47	71.2	1.448	2.047	2.030	30	S. W.	23.23
Oct.	29.435	29.416	29.429	29.427	29.915	13.28	794	29.1131	46.0	55.2	49.7	50.293	2.8	31.0	25.51	54.9	1.996	2.304	2.131	33	N. W.	18.18
Nov.	29.423	29.389	29.392	29.405	29.598	12.28	823	9.1166	36.5	44.9	41.6	41.793	2.5	6.0	15.54	2.50	1.169	2.712	2.547	27	S. W.	25.25
Dec.	29.404	29.388	29.424	29.405	29.783	19.28	792	17.091	26.7	35.9	30.8	31.164	0	-2.0	19.61	40.2	1.948	2.211	2.057	27	N. W.	17.17
Sums.	352.690	352.450	352.615	352.589	.....	.....	.....	514.9	647.7	574.7	579.1	.....	.....	.....	683.8435	22.162	28.927	27.979	79.068	.....	.....	.....
Means.	29.392	29.371	29.385	29.383	30.068	*17.28	754	114	42.9	54.0	47.9	48.992	1.29	-23.0	122	56.9	36.2	34.8	32.1	33.6	.....	.....

January.

July.

June.

May.

February.

Month.	Winds at 7 a. m., 8 and 11 p. m. direction and number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 8 consecutive hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Part.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
										Total amount.	Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.									Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 6.06 a. m., 2.06 p. m., and 10.06 p. m. local time. Correction for instrumental error of barometer used: From 6.06 a. m., January 1, to 10.06 p. m., December 31, inclusive, — .005 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.700; March, 0.690; April, 0.670; May, 0.640; June, 0.640; July, 0.630; August, 0.630; September, 0.630; October, 0.630; November, 0.630; December, 0.710.

ROBT. R. MARTIN  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DAVIS FORT, TEX.

[Latitude, 28° 29' N.; longitude, 108° 56' W. Magnetic variation, 11° E. Elevation of barometer above sea-level, 4,940 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.						
	Washington time.					Monthly mean.					Washington time.					Self-registering ther- mometers.					Washington time.						
	7 P. M.	8 P. M.	11 P. M.	Date.	Range.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Highest.	Date.	Minimum.	Maximum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 P. M.	7 P. M.	8 P. M.	Total.	Miles.	Direction from—	Date.	
	In.	In.	In.																								In.
1883.																											
Jan .....	25.223	25.177	25.185	25.195	25.482	24.940	18	482	30.1	54.9	41.1	42.0	60.0	31.17	0	61.1	52.0	57.0	28.2	611	1,459	1,486	3,556	24	N.	8	
Feb .....	25.245	25.207	25.225	25.238	25.618	27.24	790	15	828	35.8	57.4	44.5	45.0	74.0	1	9.0	65.0	80.1	32.6	1,039	1,524	1,760	4,323	23	N.	24	
Mar .....	25.179	25.143	25.155	25.159	25.447	3.24	832	23	615	44.9	63.7	52.2	53.6	83.0	27	28.0	55.0	65.4	41.4	1,046	1,840	1,744	4,630	22	N.	15	
Apr .....	25.124	25.082	25.092	25.099	25.554	15.24	708	20	846	48.1	68.3	57.3	58.2	92.0	6	17.33	68.0	74.2	45.0	1,110	2,102	2,068	5,280	22	W.	29	
May .....	25.181	25.145	25.138	25.155	25.416	26.24	900	16	516	58.2	80.4	68.4	68.8	98.0	23	45.0	1	51.0	64.8	54.3	947	1,538	1,725	4,210	20	S. N. E.	13
June .....	25.199	25.172	25.164	25.178	25.340	30.24	940	8	380	66.2	87.1	74.2	75.8	102.0	21	57.0	0	45.0	94.0	62.8	792	1,439	1,637	3,878	32	N.	6, 27
July .....	25.273	25.228	25.227	25.243	25.452	18.25	101	18	851	65.6	88.8	71.9	73.8	97.0	20	58.0	8	88.0	98.9	62.8	635	1,165	1,374	3,174	16	E.	29
Aug .....	25.301	25.261	25.260	25.277	25.443	28.25	141	11	302	64.0	82.8	72.0	72.9	97.0	1	53.0	25	44.0	99.9	60.7	519	995	1,169	2,654	16	S.W.	4
Sept .....	25.287	25.253	25.259	25.266	25.479	21.55	039	13	440	57.6	77.1	65.8	67.0	94.0	1	57.0	22	57.0	81.4	64.4	532	1,133	1,433	3,293	20	N.	20
Oct .....	25.204	25.163	25.182	25.193	25.500	31.23	907	27	593	53.2	73.0	66.9	68.7	87.0	1, 27	0	50	74.5	60.6	541	1,391	1,499	3,431	28	S.	16	
Nov .....	25.287	25.220	25.246	25.251	25.941	12.24	941	9	633	41.1	63.1	50.7	51.9	81.6	27	56.5	27	85.8	38.9	946	1,624	1,875	4,169	20	N.	10, 28	
Dec .....	25.391	25.227	25.248	25.254	25.632	15.25	017	17	615	34.1	58.6	45.4	46.7	75.0	21	52.0	9	63.0	84.2	34.6	1,289	1,989	2,148	5,425	24	N.	8
Sum .....	302.794	302.376	302.805	302.486						600.9	382.1	702.9	718.5					386.7	565.8		9, 970	18, 290	19, 738	47, 988			
Means .....	25.298	25.190	25.190	25.207	25.632	*15.24	766	190		50.1	71.0	58.6	59.9	102.0	121	9.0		74.7	47.2								

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

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Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

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11 P. M.

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Total.

Miles.

Direction from—

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Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

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Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

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Total.

Miles.

Direction from—

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

Date.

1883.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

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Total.

Miles.

Direction from—

Date.

1883.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

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Barometer (corrected for temperature and instrumental error only).

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Self-registering ther-  
mometers.

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Mean maximum.

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11 P. M.

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Total.

Miles.

Direction from—

Date.

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

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Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

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11 P. M.

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Total.

Miles.

Direction from—

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Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

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Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

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Total.

Miles.

Direction from—

Date.

1883.

Jan .....

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Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

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Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

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May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

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Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

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Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

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Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

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Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

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Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

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May .....

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Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

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May .....

June .....

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Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.

11 P. M.

7 P. M.

8 P. M.

Total.

Miles.

Direction from—

Date.

1883.

Jan .....

Feb .....

Mar .....

Apr .....

May .....

June .....

July .....

Aug .....

Sept .....

Oct .....

Nov .....

Dec .....

Sum .....

Means .....

Barometer (corrected for temperature and instrumental error only).

Temperature.

Wind.

Maximum hourly velocity during month.

Washington time.

Self-registering ther-  
mometers.

Washington time.

Mean maximum.

Mean minimum.</

B.—Elevation determined by barometer.

† December.

‡ April.

§ June.

¶ February.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.					
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive hours hourly measurements.	Total amount.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 32°.		
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.
1883.																													
Jan. ....	5	4	2	18	8	16	3	29	0.02 0.02	Ja. 7a.	1.8	2.5	1.4	1.9	23.1	17.4	17.6	19.4	73.6	24.4	40.8	46.9	21	8	2	1	0	0	
Feb. ....	12	12	11	6	4	14	2	20	0.02 0.01	Ja. 7a.	4.5	6.3	2.7	4.6	26.4	24.8	25.4	25.5	68.5	33.2	50.6	50.8	9	12	7	2	0	0	
Mar. ....	14	5	2	14	26	8	5	18	0.52 0.45	Ja. 7a.	7.4	6.4	3.9	4.6	34.4	31.6	33.5	33.2	69.7	37.8	64.9	64.1	12	11	8	4	0	1	
Apr. ....	12	6	9	9	13	21	13	14	0.00 0.67	Ja. 7a.	2.6	4.2	1.7	2.8	32.5	22.7	29.8	28.3	54.7	20.8	38.8	38.1	18	8	4	3	0	0	
May. ....	15	6	9	4	13	19	3	23	1.00 0.52	Ja. 7a.	2.4	3.8	2.3	2.6	43.5	30.5	38.5	37.5	59.8	19.2	41.0	40.0	18	9	4	3	0	0	
June. ....	13	7	12	9	4	24	0	19	1.71 0.88	Ja. 7a.	1.1	4.8	2.0	2.6	51.2	42.7	48.7	47.5	59.6	24.4	43.4	42.5	17	13	0	7	0	0	
July. ....	6	4	26	7	7	16	1	24	3.63 1.14	Ja. 7a.	1.6	5.4	2.3	3.1	55.8	54.0	55.7	55.0	70.8	40.3	68.6	68.5	19	11	1	10	0	25	
Aug. ....	13	2	20	13	4	9	0	31	3.07 0.98	Ja. 7a.	1.1	4.1	2.3	2.5	54.3	48.0	53.7	52.0	70.9	33.7	64.1	52.9	21	9	1	10	0	13	
Sept. ....	17	13	19	15	0	4	1	21	1.49 0.82	Ja. 7a.	8.6	4.7	3.3	3.9	49.6	46.9	50.3	48.9	75.2	37.5	59.0	57.2	17	6	7	7	0	0	
Oct. ....	6	11	1	33	12	10	0	18	0.42 0.41	Ja. 7a.	3.4	4.7	2.3	3.4	44.9	41.2	45.8	44.0	75.2	33.7	61.3	56.7	14	12	5	3	0	1	
Nov. ....	15	6	8	29	7	8	1	19	0.64 0.45	Ja. 7a.	1.1	3.6	4.2	2.6	33.1	33.7	33.7	33.5	75.0	39.0	57.1	57.0	16	11	8	8	0	0	
Dec. ....	21	5	1	6	17	27	1	10	0.81 0.66	Ja. 7a.	12	3.6	2.3	2.9	27.9	28.3	29.9	28.7	73.2	86.2	67.4	55.6	19	8	4	3	0	0	
Sums ..	149	60	115	151	93	197	36	245	14.22	Ja. 7a.	32.9	53.2	22.9	32.6	476.2	421.9	462.6	453.5	825.7	382.2	617.2	608.3	201	118	46	55	0	50	60
Means ..	Percentages.																												
	13.6 7.3 10.5 13.8 9.8 18.3 3.3 20.4 0.352 2.7 4.4 2.5 3.2 39.7 36.2 38.6 37.8 68.8 31.8 51.4 50.7 55.1 32.3 12.6 1.1 0.13 7.16 4																												

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.13 a. m., 1.13 p. m., and 9.13 p. m., local time. Corrections for instrumental errors of barometer used: From 5.13 a. m., January 1, to 6.13 p. m., February 28, inclusive, .000 inch; from 5.13 a. m., March 1, to 9.13 p. m., December 31, inclusive, +.035 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.880; February, 4.980; March, 4.880; April, 4.790; May, 4.720; June, 4.610; July, 4.640; August, 4.650; September, 4.700; October, 4.850; November, 4.900; December, 4.940.

JEROME WILLIAMS,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DAYTON, WASH. T.

[Latitude, 46° 19' N.; longitude, 117° 59' W. Magnetic variation, 21° 30' E. Elevation of barometer above sea-level, 1,667 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.			Monthly means.			Highest.			Range.	Washington time.			Self-registering ther- mometers.			Mean maximum.			Mean minimum.			Washington time.			Maximum hourly velocity during month.		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	F.	Date.	Lowest.	Date.		In.	Th.	F.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	11 p. m. to 7 a. m.	7 p. m. to 3 p. m.	8 p. m. to 11 p. m.	Total.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

B.—Elevation determined by barometer.

† February.

‡ December.

§ August.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.						
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.		
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 a. m.	Mean.
1883.																														
Jan.	6	15	0	1	20	37	6	3	2 5.16	1.25	7.7	8.4	8.0	8.0	18.5	23.5	21.0	21.0	83.7	76.4	82.5	80.5	0	25	0	11	25	0		
Feb.	16	17	0	1	7	52	4	3	1 17.0	1.23	2.0	4.2	3.8	2.6	5.0	17.5	10.6	11.0	73.5	68.0	77.6	73.0	0	13	27	0	19	0		
Mar.	4	17	3	6	7	52	3	1	2 44.1	0.97	4.5	7.8	3.4	4.2	32.0	38.6	38.0	38.2	53.4	59.3	73.6	72.6	0	0	0	4	0	0		
Apr.	2	10	3	3	17	50	5	1	1 64.0	0.63	3.1	7.8	3.0	3.3	31.8	33.2	33.6	34.2	70.7	52.9	67.4	65.7	0	0	0	0	0	0		
May	1	17	6	6	15	40	1	1	1 28.0	1.16	2.5	3.5	3.5	3.0	38.8	41.8	44.0	41.5	60.5	46.5	64.4	60.3	0	0	0	0	0	0		
June	1	12	0	2	8	61	1	2	0 06.0	0.63	2.6	3.2	2.9	3.0	41.9	44.5	44.5	44.3	66.5	34.0	50.3	50.3	0	0	0	0	0	0		
July	0	15	0	0	19	42	3	2	2 00.0	0.00	1.9	1.2	1.2	1.4	42.3	44.5	44.5	43.6	60.0	27.6	38.9	42.2	0	0	0	0	0	0		
Aug.	0	12	1	1	14	43	4	2	0 30.0	0.30	1.6	0.8	1.6	1.5	43.9	48.3	46.1	46.1	64.5	33.6	46.3	46.3	0	0	0	0	0	0		
Sept.	14	18	6	0	13	29	4	3	7 09.0	0.97	2.1	2.6	2.6	2.7	37.1	32.5	40.1	40.0	62.8	33.0	55.4	51.1	0	0	0	2	1	1		
Oct.	2	18	6	0	15	37	3	3	7 44.0	0.38	4.8	7.0	5.3	5.7	84.0	87.4	83.9	81.6	66.5	70.2	71.1	71.1	0	12	15	0	13	0		
Nov.	0	11	3	2	19	46	1	0	3 11.0	0.52	2.7	6.1	6.7	6.7	83.1	85.4	83.8	84.1	62.3	61.1	70.7	73.4	0	16	13	0	16	0		
Dec.	11	15	3	2	15	29	3	7	2 99.0	0.78	4.3	6.0	4.8	5.1	25.5	23.8	27.3	27.9	87.3	76.6	80.5	83.5	0	10	14	5	23	0		
Sums	82	158	51	23	155	497	37	42	502	44	51	657	750	453	2384	2439	6423	8415	8308	1635	5798	3774	1	146	128	91	115	29	114	21
Means	Percentages.								Percentages.																Percentages.					
	7.514	4.4	72.1	11.4	24.5	4	3.4	3.8	6		4.2	4.8	4.2	4.4	32.0	36.6	36.3	34.6	74.8	52.1	66.5	64.5	40	0.085	1.24	93.1	5	7.931	215.8	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.16 a. m., 12.16 p. m., and 8.16 p. m., local time. Corrections for instrumental errors of barometer used: From 4.16 a. m., January 1, to 8.16 p. m., June 30, inclusive, —0.005 inch; from 4.16 a. m., July 1, to 8.16 p. m., December 31, inclusive, +0.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.81; February, 1.82; March, 1.82; April, 1.76; May, 1.76; June, 1.76; July, 1.73; August, 1.73; September, 1.73; October, 1.79; November, 1.79; December, 1.84.

D. MOORE  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DEADWOOD, DAK.

[Latitude, 44° 29' N.; longitude, 108° 49' W. Magnetic variation, 19° E. Elevation of barometer above sea-level, 4,600 (B) feet. Elevation of exposed thermometer above ground, 25 feet. Elevation of rain-gauge above ground, 47 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.										
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Washington time.					Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Date.	Range.	Date.	Minimum.	Maximum.	Monthly mean.	Date.	Minimum.	Maximum.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	11 p. m. to 7 p. m.	3 p. m. to 7 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction.	Miles.	Direction.	Miles.		
1883.																															
Jan.	25.307	25.220	25.240	25.222	25.496	7724.519	7724.519	11	1.000	10.9	22.9	12.5	15.862	25	30.0	20.92	30.6	3.5	801	1.074	1.120	2.905	20	SW.	11	1.074	1.120	2.905	20	SW.	
Feb.	25.381	25.355	25.395	25.372	25.766	2624.859	2624.859	14	1.007	13.8	26.8	17.6	19.362	27	32.3	18.63	48.0	24.1	393	1.040	1.040	2.905	18	SW.	16	1.040	1.040	2.905	18	SW.	
Mar.	25.347	25.324	25.325	25.332	25.838	2624.840	2624.840	17	1.008	23.6	38.7	17.0	22.570	17	17.0	18.63	48.0	24.1	393	1.040	1.040	2.905	24	NE	8	1.040	1.040	2.905	24	NE	
Apr.	25.374	25.324	25.344	25.332	25.838	2624.840	2624.840	21	1.114	32.8	41.0	38.5	32.570	31	21.0	24.2	48.0	24.1	432	1.040	1.040	2.905	20	NE	18	1.040	1.040	2.905	20	NE	
May.	25.392	25.304	25.308	25.305	25.634	2624.770	2624.770	11	1.014	40.1	47.5	42.3	36.873	31	21.0	24.2	48.0	24.1	432	1.040	1.040	2.905	20	NE	18	1.040	1.040	2.905	20	NE	
June.	25.377	25.363	25.375	25.372	25.554	2624.770	2624.770	11	1.014	40.1	47.5	42.3	36.873	31	21.0	24.2	48.0	24.1	432	1.040	1.040	2.905	20	NE	18	1.040	1.040	2.905	20	NE	
July.	25.440	25.420	25.412	25.437	25.648	2725.044	2725.044	10	1.010	52.4	69.5	60.8	32.684	28	28.0	27.47	70.0	49.5	560	1.123	1.123	2.905	24	NE	20	1.123	1.123	2.905	24	NE	
Aug.	25.481	25.453	25.477	25.470	25.672	2725.118	2725.118	15	1.044	54.0	69.5	60.8	32.684	28	28.0	27.47	70.0	49.5	560	1.123	1.123	2.905	24	NE	20	1.123	1.123	2.905	24	NE	
Sept.	25.465	25.466	25.484	25.478	25.902	2725.118	2725.118	21	1.044	54.0	69.5	60.8	32.684	28	28.0	27.47	70.0	49.5	560	1.123	1.123	2.905	24	NE	20	1.123	1.123	2.905	24	NE	
Oct.	25.441	25.422	25.461	25.441	25.710	2725.118	2725.118	12	1.044	54.0	69.5	60.8	32.684	28	28.0	27.47	70.0	49.5	560	1.123	1.123	2.905	24	NE	20	1.123	1.123	2.905	24	NE	
Nov.	25.323	25.278	25.310	25.302	25.746	1234.915	1234.915	24	1.081	23.2	38.5	33.7	24.687	25	8.0	14.58	47.5	33.0	722	783	674	576	24	W.	24	783	674	576	24	W.	
Dec.	25.341	25.323	25.345	25.336	25.798	1434.987	1434.987	25	1.111	23.2	31.6	24.7	24.687	25	8.0	31.68	35.8	18.5	828	1.088	1.088	2.811	20	W.	25	1.088	1.088	2.811	20	W.	
Sums.	302.240	304.056	304.298	304.200	.....	.....	.....	.....	.....	424.3	508.6	467.7	485.9	.....	.....	618.5	530.8	728.9	11,172	11,551	22,992	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Means.	25.354	25.298	25.326	25.306	25.902	1234.915	1234.915	111	.....	35.4	47.1	39.6	40.590	.....	.....	51.5	51.7	605.8	691.0	602.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

B.—Elevation determined by barometer. † One 7 a. m., one 11 p. m. observation missed. ‡ September. § January. || June. ¶ February.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—							Rainfall or melted snow.	Washington time.										Number of days—					Remarks.					
	Number of calms.								Any 3 consecutive hours' measurements.	Cloudiness (in tenths.)			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 320.		Minimum below 320.	Maximum above 300.			
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.			Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									7 a. m.	3 p. m.	11 p. m.
1883.																													
Jan.....	2	29	12	4	1	30	5	1	1.74	27	6.7	5.2	7.0	8.4	11.3	88.2	77.9	85.4	83.8	8	14	0	13	0	31	0	0		
Feb.....	3	11	2	0	0	20	7	7	25	1.84	108	23	4.8	6.3	12.6	14.0	82.5	76.8	80.6	80.1	14	11	3	7	11	27	0		
Mar.....	8	35	0	1	1	13	3	0	27	5.69	23	25	6.1	31.9	34.1	32.0	87.4	74.7	81.8	81.3	9	11	15	3	26	0	0		
Apr.....	0	24	1	1	1	2	2	0	17	5.69	23	21	5.1	33.8	34.9	35.0	85.7	80.6	81.6	81.2	0	15	19	19	15	0	0		
May.....	1	37	5	3	1	2	3	8	27	10.38	30	18	5.6	34.4	35.5	36.6	88.9	83.7	84.1	88.4	4	12	15	18	1	8	0		
June.....	2	38	6	9	13	1	1	3	17	5.33	24	24	6.1	36.6	37.6	38.7	48.5	47.6	70.3	64.7	71.4	8	17	5	17	0	0	0	
July.....	6	9	8	2	18	5	5	22	13	1.82	104	22	23	5.3	52.8	52.8	77.7	65.0	76.8	73.2	11	13	7	12	0	0	0		
Aug.....	5	9	8	2	18	5	5	22	13	1.82	104	22	23	5.3	52.8	52.8	77.7	65.0	76.8	73.2	11	13	7	12	0	0	0		
Sept.....	11	20	7	4	9	4	2	20	18	1.17	172	10	13	3.4	48.9	48.4	44.3	76.7	61.7	72.9	71.4	14	13	3	2	0	1	0	
Oct.....	8	14	7	5	4	19	6	38	18	1.08	118	9	10	4.3	30.8	32.9	33.4	80.7	73.2	79.9	77.9	8	15	6	13	0	11	0	
Nov.....	5	6	2	9	8	1	10	17	9	53	4.8	13	4.5	4.7	26.1	27.1	24.7	73.0	62.6	72.4	60.3	17	11	2	7	1	24	0	
Dec.....	19	6	4	10	7	6	14	3	18	1.01	149	20	2.9	6.5	2.4	16.2	17.8	78.1	64.8	71.3	71.4	15	12	4	10	13	28	0	
Sums ..	70	238	61	101	121	77	108	256	29.74	.....	44.7	67.9	50.8	54.5	354.3	343.1	1391.7	936.5	3844.3	3900.6	5920.0	130	156	77	141	44	171	0	
Percentages.																													
Means.	6.4	21.8	5.6	6.5	6.2	11.7	17.0	9.9	23.4	.....	3.7	5.7	4.2	4.5	23.5	36.9	32.6	33.0	30.4	70.4	79.2	76.7	35.8	43.0	21.2	238.6	61.2	147.0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.14 a. m., 1.14 p. m., and 9.14 p. m., local time. Corrections for instrumental errors of barometer used: From 5.14 a. m., January 1, to 5.14 p. m., March 31, inclusive, +0.002 inch; from 7 a. m., April 1, to 11 p. m., September 29, inclusive, -0.002 inch; from 7 a. m., September 30, to 11 p. m., December 31, inclusive, -0.015 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.95; February, 4.92; March, 4.84; April, 4.69; May, 4.52; June, 4.44; July, 4.43; August, 4.44; September, 4.56; October, 4.68; November, 4.84; December, 4.99. One 7 a. m. and one 11 p. m. observation missed.

GEORGE KINGSBURY,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DELAWARE BREAKWATER, DEL.

[Latitude, 38° 48' N.; longitude, 75° 10' W. Magnetic variation, 4° 30' W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 27 feet.]

[illegible]

Month.	Wind at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—					Remarks.										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.
1883.																																
Jan.....	26	10	1	4	8	15	2	27	0	2.25	.79	20, 21	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	86.1	83.7	86.4	85.4	3	15	13	16	7	23	0	
Feb.....	17	6	0	8	9	18	2	12	0	4.71	1.16	24, 25	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	83.3	76.1	79.7	74.6	8	14	10	13	0	16	0	
Mar.....	17	10	5	7	9	21	2	12	0	2.67	1.19	22, 23	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	75.2	67.9	72.7	74.6	17	6	11	8	15	2	16	0
Apr.....	16	21	5	13	10	17	1	5	0	3.23	2.06	22, 23	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	84.5	75.4	83.6	81.5	11	11	8	15	0	1	0	0
May.....	12	18	11	16	15	9	1	5	0	.51	.44	27	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	84.3	70.4	81.9	78.9	13	19	3	8	0	0	0	0
June.....	6	5	9	20	24	19	6	4	0	4.69	1.34	27	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	84.4	70.2	88.0	80.7	15	14	2	3	0	0	0	0
July.....	12	9	4	15	24	19	5	4	0	1.89	.32	24, 25	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	84.4	67.2	88.0	80.7	19	9	3	5	0	0	0	0
Aug.....	7	27	5	9	16	14	5	10	0	1.89	.63	25, 30	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	83.4	73.0	88.0	80.7	10	10	0	0	0	0	0	0
Sept.....	4	31	5	9	13	15	3	16	0	2.62	1.12	13, 14	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	83.4	73.0	88.0	80.7	14	9	12	0	0	0	0	0
Oct.....	17	29	8	10	10	10	3	12	0	1.21	.83	13, 14	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	81.8	74.1	82.6	80.7	8	14	9	12	0	0	0	0
Nov.....	16	10	5	4	16	21	6	12	0	1.58	1.06	23	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	81.8	69.4	78.0	75.9	14	13	10	11	1	13	0	0
Dec.....	12	9	5	4	20	15	7	21	0	2.28	.93	23, 24	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	86.8	72.5	80.4	77.9	8	13	10	11	1	13	0	0
Sums ..	162	185	75	119	171	190	51	142	0	33.84	.....	.....	61, 25, 29, 30, 31	5.68	5.62	5.1	5.11	5.97	4.98	5.61	2	118	108	79	120	10	72	0	.....	Percentages.		
Means ..	14.8	15.6	9.6	10.9	15.6	17.4	7.1	13.0	0	.....	.....	.....	5.1	5.0	4.1	4.7	46.4	47.4	47.0	46.9	84.3	72.8	83.2	80.1	32.3	46.0	21.6	32.9	2.7	19.5	0	.....

Percentages.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time correspond with 7.08 a. m., 3.08 p. m., and 11.08 p. m. local time.

Correction for thermal expansion of aneroid used: From 7.08 a. m., January 1, to 11.08 p. m., December 31, inclusive, +0.004.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

TITUS, TOWNSEND

Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DENISON, TEX.

[Latitude, 33° 49' N.; longitude, 96° 22' W. Magnetic variation, 10° E. Elevation of barometer above sea-level, 767 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 28 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Washington time.			Averages.			Direction from—	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 p. m.	3 p. m.	11 p. m.							Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 p. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.

\* Station closed March 31, 1883.

Month.	Winds at 7 a. m., 3 p. m., and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—						Remarks.									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Total amount.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.		
										Largest amount.	Date.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.
1883.									In.																							
Jan.	26	7	3	15	19	4	1	12	61.19	0.58	3.4		5.4	5.7	3.2	4.8	25.5	29.4	28.8	27.9	84.3	65.5	74.7	74.8	12	11	8	12	3	15	0	
Feb.	31	4	8	11	12	8	1	3	62.78	1.33	23		7.1	7.4	5.8	6.8	32.1	34.1	33.7	33.2	86.0	64.0	75.4	75.8	7	5	16	12	4	12	0	
Mar.	32	8	5	2	23	10	4	5	43.64	2.46	24		6.2	6.9	4.6	5.9	33.0	39.3	39.7	39.2	76.3	52.4	65.8	64.8	6	16	9	11	0	3	0	
Apr.																																
May																																
June																																
July																																
Aug.																																
Sept.																																
Oct.																																
Nov.																																
Dec.																																
Sum.																																
Means																																
	Percentages.								Percentages.								Percentages.								Percentages.							

\* Station closed March 31, 1883.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time. Correction for instrumental error of barometer used: From 5.41 a. m., January 1, to 9.41 p. m., March 31, inclusive, + .003. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.840; March, 0.830; April, 0.800; May, 0.780; June, 0.780; July, 0.780; August, 0.780; September, 0.790; October, 0.800; November, 0.840; December, 0.850.

J. W. BYRAM,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DES MOINES, IOWA.

[Latitude, 41° 35' N.; longitude, 93° 37' W. Magnetic variation, 9° 45' E. Elevation of barometer above sea-level, 249 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 45 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.										
	Washington time.					Washington time.					Self-registering thermometers.					Washington time.										
	7 a. m.	9 p. m.	11 p. m.	Monthly mean.		Date.	Lowest.	Range.	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	3 p. m. to 11 p. m.	3 p. m. to 7 p. m.	Total.	Miles.	Direction from—	Maximum hourly velocity during month.	
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	Miles.	Miles.	Miles.	Miles.	Miles.	N.	10	
Jan.	29.357	29.223	29.249	29.243	29.730	29.285	29.547	121.183	2.9	12.9	9.5	8.8	39.9	12.30	28.0	21.65	0	19.7	-2.1	1,557	2,020	1,700	5,277	18	N.	10
Feb.	29.366	29.352	29.351	29.350	29.858	29.178	29.547	171.289	14.9	22.7	20.3	18.1	50	28.0	28.0	77.0	0	27.1	8.2	1,131	1,066	1,863	4,879	22	N.W.	17
Mar.	29.190	29.168	29.183	29.180	29.751	29.178	29.547	171.868	24.2	27.9	32.5	32.9	67	17	5.0	7.63	0	41.3	24.5	1,911	2,213	1,911	5,896	31	N.	18
Apr.	29.987	29.957	29.979	29.978	29.433	29.987	29.957	171.868	24.2	27.9	32.5	32.9	89	13	28.0	1.60	0	63.3	41.8	2,408	2,530	2,408	6,732	36	N.	14
May	29.027	29.003	29.010	29.013	29.437	29.027	29.003	171.868	51.4	61.9	55.5	55.8	83	6	35.0	21.48	0	65.4	48.0	1,859	1,436	1,916	5,732	22	S.W.	18
June	29.056	29.022	29.023	29.024	29.240	29.056	29.022	171.868	61.2	74.9	66.3	67.5	93	29	50.0	3.43	0	78.2	59.2	1,859	1,436	1,916	5,732	22	S.	16
July	29.117	29.091	29.078	29.085	29.435	29.117	29.091	171.868	61.2	74.9	66.3	67.5	97	1	54.0	8.43	0	85.6	65.2	1,079	1,436	1,916	5,732	22	S.W.	16
Aug.	29.105	29.162	29.160	29.172	29.419	29.105	29.162	171.868	62.4	78.6	68.2	68.7	91	21	48.0	24.43	0	90.9	60.8	828	1,552	1,917	4,594	28	N.	18
Sept.	29.197	29.165	29.179	29.180	29.556	29.197	29.165	171.868	52.7	68.4	57.9	58.4	90	1	37.0	28.53	0	70.7	50.2	866	1,618	1,917	4,594	28	N.	20
Oct.	29.200	29.165	29.179	29.181	29.656	29.200	29.165	171.868	52.7	68.4	57.9	58.4	80	8	28.0	20.52	0	56.6	41.6	1,085	1,618	1,917	4,594	28	S.E.	1
Nov.	29.162	29.134	29.154	29.157	29.740	29.162	29.134	171.868	52.7	68.4	57.9	58.4	67	8	6.0	15.31	0	48.9	28.2	1,484	1,972	1,781	5,247	32	N.	25
Dec.	29.169	29.175	29.186	29.180	29.613	29.169	29.175	171.868	52.7	68.4	57.9	58.4	87	12	-10.2	27.67	2	36.8	17.4	1,412	1,770	1,650	4,830	24	N.	14, 17
Suma..	348,933	349,617	349,738	349,769	.....	.....	.....	.....	488,060	854,653	6	.....	.....	.....	.....	.....	.....	674,543	0	15,218	20,070	58,397	.....	.....	.....	
Means	29.163	29.136	29.145	29.149	29.868	*17.28	437	122	.....	.....	.....	.....	97	11	-20	521	.....	56.2	36.9	1,208	2,192	1,925	8,167	2.5	.....	.....
									40.4	52.6	45.4	46.1	97	11	-20	521	.....	56.2	36.9	1,208	2,192	1,925	8,167	2.5	.....	.....
																								6 January.		
																									1 July.	
																									1 April.	
																									1 February.	

\* February.

† April.

‡ July.

§ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Total amount.  In.	Any 3 con- secutive 8 hourly mean- moths.	Date.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°	Minimum below 32°	Maximum above 90°																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.53 a. m., 1.53 p. m., and 9.53 p. m., local time. Correction for instrumental error of barometer used: From 5.53 a. m., January 1, to 9.53 p. m., December 31, inclusive, +.012 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.970; February, 0.970; March, 0.980; April, 0.980; May, 0.880; June, 0.880; July, 0.880; August, 0.880; September, 0.890; October, 0.920; November, 0.850; December, 0.880.

F. W. CONRAD,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

DES MOINES, IOWA.

[Latitude, 41° 35' N.; longitude, 93° 37' W. Magnetic variation, 9° 45' E. Elevation of barometer above sea-level, 949 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 45 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.														
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Washington time.			Total.	Miles.	Direction.	Maximum hourly velocity during month.	Date.			
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.						11 p. m.	Miles.	
1883.																													
Jan.	29.257	29.223	29.249	29.243	29.730	29.284	547	121	183	3.9	12.9	8.5	8.8	39.9	12.30	26.0	21.65	0	19.7	0	2.1	1.557	2.030	1.700	5.277	31	N.	10	
Feb.	29.366	29.322	29.351	29.350	29.858	17.28	569	151	180	14.0	22.9	20.8	19.1	50	17.28	23.0	4.73	0	27.1	0	4.2	1.131	1.663	1.583	4.379	23	N.W.	17	
Mar.	29.190	29.168	29.183	29.180	29.751	3.28	563	171	188	28.5	37.7	32.6	32.9	67	17.50	23.0	7.62	0	41.3	0	24.5	1.623	2.273	1.911	5.896	31	N.	17	
Apr.	29.097	29.057	29.079	29.075	29.433	24.28	437	22	996	44.3	59.8	51.3	51.8	89	13.23	29.0	1.64	0	65.4	0	41.8	1.723	2.230	2.406	5.732	36	N.W.	14	
May.	29.027	29.003	29.010	29.013	29.437	11.28	443	118	994	50.3	61.6	55.5	55.8	83	29.50	50.0	3.43	0	78.2	0	59.2	1.805	2.420	1.805	4.186	23	N.	18	
June.	29.058	29.023	29.023	29.034	29.240	14.28	708	11	534	61.3	71.9	66.3	67.5	83	29.50	50.0	8.42	0	85.6	0	65.2	1.805	2.420	1.805	4.186	23	N.	16	
July.	29.117	29.091	29.078	29.093	29.435	18.28	800	12	635	62.9	81.6	72.3	73.8	97	21.43	54.0	8.42	0	85.6	0	65.2	1.075	1.630	1.443	4.186	23	N.	1	
Aug.	29.105	29.103	29.109	29.103	29.419	5.28	700	21	650	62.9	82.4	78.6	68.2	91	21.43	54.0	24.43	0	80.9	0	60.8	0.798	1.512	1.317	3.697	28	N.W.	18	
Sept.	29.197	29.165	29.177	29.180	29.526	9.28	823	24	704	52.7	68.4	57.0	59.4	90	18.28	28.0	20.53	0	70.7	0	59.2	1.085	1.630	1.443	4.186	23	N.	20	
Oct.	29.200	29.165	29.179	29.181	29.658	15.28	619	28	1,037	43.0	54.3	47.9	48.7	87	18.28	28.0	20.53	0	54.6	0	41.6	1.085	1.630	1.443	4.186	23	N.	1	
Nov.	29.183	29.184	29.154	29.157	29.740	12.28	524	25	1,037	43.0	54.3	47.9	48.7	87	18.28	28.0	15.31	0	48.9	0	24.2	1.491	1.972	1.761	3.247	32	N.	25	
Dec.	29.166	29.175	29.195	29.196	29.613	14.28	503	17	1,110	28.0	32.5	28.3	27.8	57	12.10	28.0	27.67	0	36.8	0	17.4	1.412	1.770	1.659	3.247	32	N.	14	
Suma.	348.953	348.617	349.738	349.766					468.0	630.854	653.6								674.5	443.0	15.218	21.109	20.070	58.397					
Means.	29.163	29.135	29.145	29.146	29.858	*17.28	437	122		40.4	52.6	45.4	46.1	97	11	—26	321		56.2	36.9	1.268	21.925	21.672	5					
										Averages.																			
										† April.										† July.					§ January.				
										* February.																			

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										In.	W.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.		7 a. m.								3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Percentages.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.53 a. m., 1.53 p. m., and 9.53 p. m., local time.

Correction for instrumental error of barometer used: From 5.53 a. m., January 1, to 9.53 p. m., December 31, inclusive, +0.12 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.970; February, 0.970; March, 0.960; April, 0.960; May, 0.890; June, 0.880; July, 0.880; August, 0.880; September, 0.880; October, 0.920; November, 0.900; December, 0.900.

F. W. CONRAD,

Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DETROIT, MICH.

[Latitude, 42° 20' N.; longitude, 83° 3' W. Magnetic variation, 0° 15' E. Elevation of barometer above sea-level, 601 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 71 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.						Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.			Range.	Date.	Lowest.	Highest.	Monthly mean.			Self-registering thermometers.			Washington time.			Total.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.	3 p. m.	11 p. m.					Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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† October.

‡ July.

\* One 7 a. m. observation missed.

§ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Washington time.										Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Any 3 con- secutive 8 hourly measure- ments.		Total amount.		Date.			Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	North- east.	East.	Southeast.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.		West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.								South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	North- west.	East.	North- east.	South.	South- west.	West.	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\*One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time. Correction for instrumental error of barometer used: From 0.36 a. m., January 1, to 10.36 p. m., December 31, inclusive, +0.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.760; February, 0.750; March, 0.750; April, 0.750; May, 0.730; June, 0.690; July, 0.660; August, 0.690; September, 0.660; October, 0.710; November, 0.740; December, 0.760.

CHAS. K. CUNNINGHAM,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DODGE CITY, KANS.

[Latitude, 37° 49' N.; longitude, 100° W. Magnetic variation, 12° 30' E. Elevation of barometer above sea-level, 2,517 feet. Elevation of exposed thermometer above ground, 31 feet. Elevation of rain-gauge above ground, 36 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.																		
Month.	Washington time.			Monthly mean.			Range.			Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.													
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	Date.	Lowest.	Date.	In.	Th.	Date.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.		Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	8 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Miles.	Total.	Miles.	Direction from—	Date.		
1883.																																
Jan.	27.457	27.417	27.470	27.448	27.786	22.26.836	12	1.950	14.2	30.2	21.9	23.1	59.0	0	0	9	20.0	19.79.0	34.5	10.3	31.763	1.933	7 a. m. to 11 p. m.	Miles.	7 a. m. to 3 p. m.	Miles.	3 p. m. to 11 p. m.	Miles.	Total.	Miles.	E.	18
Feb.	27.688	27.542	27.568	27.566	28.141	4.26.777	15	1.964	18.0	34.9	25.7	26.2	67.0	0	0	28	20.0	4.57.0	37.9	15.4	2.611	2.431	7.210	38	N.W.	18	22	36	N.W.	18		
Mar.	27.449	27.409	27.437	27.432	28.033	3.26.988	18	1.945	32.3	49.9	40.2	40.8	87.2	0	0	15	15.0	19.57.0	51.7	29.4	2.776	2.645	7.638	46	N.W.	20	64	36	N.W.	20		
Apr.	27.255	27.242	27.244	27.247	27.896	13.26.315	21	1.581	43.2	63.3	53.4	53.0	88.0	0	0	13	29.0	6.56.0	65.8	42.4	2.894	3.823	7.798	10	N.	17	54	49	W.	17		
May	27.321	27.289	27.308	27.306	27.644	10.26.655	17	1.980	50.7	71.8	59.0	60.5	98.0	0	0	23	35.0	3.53.0	74.5	49.3	3.458	3.504	7.746	49	W.	15	56	44	SW.	15		
June	27.574	27.361	27.401	27.365	27.583	29.26.993	11	1.590	62.4	80.0	69.0	70.5	97.0	0	0	20	48.0	10.49.0	83.6	59.5	2.833	3.204	7.499	9	N.W.	9	56	40	SW.	9		
July	27.437	27.404	27.419	27.420	27.669	17.27.118	13	1.553	68.3	86.2	74.0	76.2	99.0	0	0	12	56.0	8.43.0	88.4	68.4	4.426	4.155	8.235	8	N.W.	15	70	43	SW.	15		
Aug.	27.439	27.485	27.484	27.486	27.640	28.27.199	21	1.441	64.5	79.7	71.0	71.7	93.0	0	0	31	53.0	23.39.0	82.5	63.4	3.246	3.081	8.050	8	N.W.	9	40	35	N.W.	9		
Sept.	27.497	27.469	27.484	27.483	27.817	20.27.147	13	1.670	56.0	73.9	62.5	64.1	97.0	0	0	1	39.5	23.37.0	76.4	54.0	2.244	3.043	7.289	44	N.W.	4	20	38	N.W.	4		
Oct.	27.408	27.393	27.419	27.407	27.901	31.26.961	1	1.940	44.9	57.8	49.7	50.9	90.0	0	0	1	26.0	25.64.0	59.2	42.0	2.031	2.877	7.832	44	E.	23	44	40	E.	23		
Nov.	27.450	27.410	27.449	27.436	28.013	12.26.929	25	1.084	32.2	53.6	39.6	41.8	87.0	0	0	30	14.0	14.59.0	55.8	29.1	1.964	2.719	7.440	40	N.W.	15	44	40	N.W.	15		
Dec.	27.462	27.432	27.438	27.461	27.981	14.26.851	26	1.130	28.2	43.4	32.9	34.8	87.0	0	0	1	2.0	31.05.0	48.2	24.3	1.964	2.719	7.440	40	N.W.	15	44	40	N.W.	15		
Sums.	329.187	328.853	329.131	329.037					514.974	7.598	3.612	5						756.5	485.5	29.247	37.519	37.426	104.192									
Means.	27.432	27.404	27.428	27.421	28.141	84.26.315	921		42.9	60.4	49.9	51.1	99.0	0	0	12	20.0	19.19.0	63.0	40.5	2.477	2.877	7.740	40	N.W.							

\* April.  
 \* July.  
 \* January.

\* Twenty-six observations missed.  
 \* For 28 days.  
 \* No record.  
 \* February.

\* Two 7 a. m., one 3 p. m., two 11 p. m. observations missed.  
 \* One 7 a. m. observation missed.  
 \* Nine observations missed.  
 \* Eight observations missed.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.		Washington time.						Number of days—						Remarks.									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
										Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									7 a. m.	3 p. m.	11 p. m.
1883.																															
Jan. 1	12	8	10	7	4	14	6	25	2	0.44	0.12	16	4.1	5.3	3.8	4.4	7.8	16.7	13.3	12.6	76.6	60.4	69.5	68.8	11	10	7	13	29	0	
Feb.	11	7	8	15	5	7	7	21	3	1.42	1.13	13	3.5	5.0	2.4	3.6	12.2	16.0	15.4	14.5	78.9	49.8	66.8	65.2	15	8	5	4	10	25	0
Mar.	18	13	13	7	9	9	9	10	3	0.42	0.22	24	4.4	4.5	2.7	4.2	24.7	24.4	24.4	24.5	74.0	43.4	55.8	57.6	14	10	7	4	0	19	0
Apr.	11	8	5	10	21	15	13	4	2.40	1.49	20	3.1	4.5	2.8	3.5	34.1	33.8	34.8	34.2	71.7	39.2	55.3	55.4	13	15	1	6	0	1	0	
May	11	13	5	6	5	20	14	5	5.41	3.65	16	17	3.3	3.4	3.4	42.9	44.3	45.5	44.2	75.9	39.3	62.7	59.3	12	16	3	9	0	0	0	
June	7	5	11	11	15	29	6	2	4.31	1.41	8	4.2	4.0	3.3	3.8	58.0	58.6	60.2	58.9	80.2	50.3	72.9	69.8	11	17	2	10	0	0	6	
July	5	8	3	10	16	35	12	2	2.61	0.81	6	4.1	4.4	4.7	4.4	58.5	60.6	60.5	59.9	71.8	44.7	62.8	59.8	12	12	7	8	0	0	15	
Aug.	4	11	9	49	11	7	1	0	5.66	1.64	11	12	4.6	4.4	3.7	4.2	61.9	64.3	63.6	61.4	61.5	80.6	77.8	12	15	3	7	0	0	1	
Sept.	5	12	5	36	9	3	17	0	1.32	0.58	13	14	4.6	4.0	2.3	3.6	50.6	51.5	52.6	51.6	62.6	47.9	71.2	67.2	12	12	11	10	0	1	0
Oct.	21	9	11	22	4	1	7	15	3.32	1.48	16	17	5.6	6.5	4.5	5.5	39.3	40.7	40.4	40.1	81.1	57.7	71.6	70.1	8	12	11	10	0	1	0
Nov.	9	4	9	17	15	7	16	6	1.5	0.12	4	5	3.1	3.0	1.3	1.9	26.2	27.5	28.5	27.4	79.0	39.6	65.0	61.2	20	10	0	2	0	18	0
Dec.	7	6	3	12	8	7	15	22	1.07	0.64	5	3	1	5.4	3.1	3.9	21.5	25.0	25.5	24.0	75.4	52.9	74.9	67.7	11	15	5	5	4	27	0
Sums	121	104	87	199	111	160	102	158	47	28.50	.....	46.1	54.4	39.0	46.3	437.7	463.4	465.5	465.5	594.4	658.6	780.8	677.9	151	132	58	83	27	120	25	
Means	11.19	6.8	0.18	3.10	2.14	7.9	4.14	5.4	3	.....	.....	3.8	4.5	3.2	3.8	36.5	38.6	38.8	38.0	78.7	48.9	67.4	65.0	41.8	42.1	16	122	7.7	4.33	16.8	

Two 7 a. m., one 3 p. m., two 11 p. m. observations missed. One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.27 a. m., 1.27 p. m., and 9.27 p. m., local time. Correction for instrumental error of barometer used: From 5.27 a. m., January 1, to 9.27 p. m., December 31, inclusive, +.023 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.75; February, 2.74; March, 2.73; April, 2.64; May, 2.65; June, 2.51; July, 2.50; August, 2.48; September, 2.56; October, 2.63; November, 2.74; December, 2.80.

J. C. LANOUETTE,  
Sergeant, Signal Corps, U. S. A.





APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

DENISON, TEX.

[Latitude, 33° 48' N.; longitude, 99° 32' W. Magnetic variation, 10° E. Elevation of barometer above sea-level, 767 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 28 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.								Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.			Monthly mean.			Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 p. m.	8 p. m.	11 p. m.	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	Date.	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Washington time.			Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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1883.	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	Jan.	<i>I<sub>w</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>w</sub></i>	30.3	42.1	38.9	38.4	467.0	29.0	3	20	68.7	47.1	27.6	47.1	27.6	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	8.	12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Jan.	29.368	29.328	29.349	29.348	29.328	29.348	29.328	12	690	30.3	42.1	38.9	47.1	38.9	38.4	467.0	29.0	3	20	68.7	47.1	27.6	47.1	27.6	1,744	1,717	5,628	34	8.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Feb.	29.448	29.413	29.441	29.424	29.440	18	28.803	15	1.134	36.2	47.1	41.8	47.1	41.8	41.775.0	15.5	6	4	70.0	51.6	33.4	51.6	33.4	1,684	1,667	4,823	28	8.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Mar.	29.273	29.239	29.253	29.255	29.276	8	28.794	24	0.982	45.4	56.5	51.6	56.5	51.6	52.277.4	19.7	2	19	50.2	68.7	43.6	68.7	43.6	1,346	1,363	4,133	20	S.E.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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\* Station closed March 31, 1883.

## REPORT OF THE CHIEF SIGNAL OFFICER.

485

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—					Remarks.											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Any 3 consecutive 8 hourly measurements.		Largest amount.	Date.	Cloudiness (in tenths).			Dew point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
											Total amount.	W.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.		11 p. m.	Mean.	7 a. m.	8 p. m.							
1883.																																
Jan.	26	7	3	15	4	1	12	61.19	0.58	3.4	3.4	5.4	5.7	3.2	4.8	25.5	29.4	23.8	27.9	84.3	65.5	74.7	74.8	12	11	8	12	3	15	0		
Feb.	31	4	8	11	12	8	1	3	62.78	1.38	23	23	7.1	7.4	5.8	6.8	32.1	34.1	33.7	33.2	86.0	66.0	75.4	75.8	7	5	16	12	4	12	0	
Mar.	32	8	5	2	23	10	4	5	43.54	2.46	24	24	6.2	6.9	4.6	5.9	33.0	33.8	33.7	33.2	76.3	63.4	65.8	64.8	6	16	9	11	0	3	0	
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Sums.																																
Means.																																

\* Station closed March 31, 1883.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time.

Correction for instrumental error of barometer used: From 5.41 a. m., January 1, to 9.41 p. m., March 31, inclusive, + .003.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.840; March, 0.830; April, 0.800; May, 0.790; June, 0.780; July, 0.780; August, 0.780; September, 0.790; October, 0.800; November, 0.840; December, 0.850.

J. W. BYRAM  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DENVER, COLO.

[Latitude, 39° 45' N.; longitude, 105° W. Magnetic variation, 14° 45' E. Elevation of barometer above sea-level, 5,204 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 88 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.												
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Washington time.					Miles.	Direction from—	Date.
	7 a. m.	3 p. m.	11 p. m.	Range.		Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.			
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
Jan	24.633	24.605	24.660	24.633	24.990	724.163	12	724.163	12	1.827	21.6	33.5	28.2	28.4	61.0	11	26.0	10	19.81	39.9	15.9	1,836	1,729	1,896	4,941	54	W.	
Feb	24.751	24.713	24.773	24.746	25.263	267.412	15	267.412	15	1.191	15.2	29.7	21.1	22.0	66.0	23	22.0	0	4.78	64.8	31.0	1,188	1,702	1,811	4,949	23	W.	
Mar	24.712	24.685	24.707	24.701	25.271	228.223	30	228.223	30	.948	35.1	52.0	44.5	43.8	70.0	26	18.0	0	19.52	58.0	31.1	1,183	1,172	1,633	3,828	80	N.W.	
Apr	24.593	24.555	24.568	24.562	25.145	242.872	17	242.872	17	1.403	37.4	53.5	45.9	45.6	73.0	26	22.0	0	20.51	56.0	34.1	1,267	1,415	1,942	4,664	40	N.W.	
May	24.662	24.634	24.679	24.658	25.028	202.041	17	202.041	17	1.463	46.4	51.6	54.6	54.2	73.0	26	31.5	0	30.47	66.0	41.9	1,254	1,536	2,113	3,864	24	N.	
June	24.791	24.753	24.784	24.773	24.968	27.24.601	30	27.24.601	30	.500	56.4	62.8	65.5	64.9	91.0	30	37.0	0	13.54	70.6	53.8	1,121	1,166	1,577	3,864	24	N.	
July	24.877	24.846	24.825	24.823	24.960	7.24.663	15	7.24.663	15	.422	61.2	61.8	71.5	71.2	95.5	26	53.0	0	22.43	82.6	58.7	1,491	1,276	1,697	4,064	27	SW.	
Aug	24.870	24.841	24.860	24.858	25.023	27.24.601	30	27.24.601	30	.424	61.2	61.8	71.5	71.2	95.5	26	53.0	0	22.43	82.6	58.7	1,491	1,276	1,697	4,064	27	SW.	
Sept	24.889	24.841	24.873	24.868	25.319	20.24.354	27	20.24.354	27	.735	61.9	72.0	61.0	61.7	87.0	7	84.5	0	17.57	47.6	50.2	1,526	1,820	1,915	4,469	28	N.W.	
Oct	24.704	24.655	24.708	24.685	25.112	31.24.315	24	31.24.315	24	.877	39.0	53.7	41.0	46.7	73.0	7	84.5	0	17.57	47.6	50.2	1,526	1,820	1,915	4,469	28	N.W.	
Nov	24.727	24.677	24.728	24.711	25.137	11.24.232	25	11.24.232	25	.875	39.0	53.7	41.0	46.7	73.0	7	84.5	0	17.57	47.6	50.2	1,526	1,820	1,915	4,469	28	N.W.	
Dec	24.708	24.665	24.746	24.717	25.205	14.24.221	25	14.24.221	25	.864	37.8	53.6	31.0	32.5	63.0	17	2	0	31.60	42.5	23.5	1,893	2,186	1,972	6,001	48	SW.	
Sums	259.867	260.463	260.941	260.759	.....	.....	.....	.....	.....	487.4	683.9	582.5	583.1	.....	.....	.....	.....	.....	.....	728.6444	4	15,796	16,927	21,403	54,066	.....	.....	
Means.	24.739	24.705	24.745	24.730	25.319	*20.22.742	121	.....	.....	40.6	57.2	48.5	48.8	48.5	95.5	119	22	.....	.....	60.6	37.0	1,311.31	1,410.61	1,783.0	.....	.....	.....	
																									Averages.		6 February.	

§ February.

† July.

† April.

\* September.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.	Washington time.						Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.		11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.08 a. m., 1.08 p. m., and 9.08 p. m. local time.

Correction for instrumental error of barometer used: From 5.08 a. m., January 1, to 9.08 p. m., December 31, inclusive, +0.038 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.520; February, 5.520; March, 5.440; April, 5.270; May, 5.160; June, 5.040; July, 5.010; August, 5.020; September, 5.110; October, 5.200; November, 5.500; December, 5.520.

F. M. NEAL,

Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DES MOINES, IOWA.

[Latitude, 41° 35' N.; longitude, 93° 37' W. Magnetic variation, 9° 45' E. Elevation of barometer above sea-level, 940 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 45 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.			Washington time.			Averages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 a. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 p. m. to 3 p. m.		3 p. m. to 11 p. m.	Total.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

January.

July.

April.

February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—						Remarks.						
	Number of calms.								Any 3 con- secutive 8 hourly mea- sure- ments.		Clondness (in tenths).			Dew-point.			Relative humidity (per cent.).				Number of days—												
											7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.								Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	
North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	In.	In.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
1883.																																	
Jan .....	24	9	5	14	4	6	4	26	1	1.72	.38	7	4.2	6.8	4.9	5.3	6.2	12.2	10.6	9.7	67.1	61.9	63.0	61.9	10	13	8	16	25	31	0	One 11 p. m. obser- vation missed.	
Feb .....	15	6	2	9	8	14	8	19	3	2.51	.98	24	4.6	6.2	5.2	5.3	6.2	12.2	10.6	9.7	67.1	63.2	66.0	65.4	9	7	12	12	15	26	0	One 7 a. m. obser- vation missed.	
Mar .....	31	13	14	6	4	5	10	10	0	.57	.29	27	5.4	7.0	5.5	6.0	30.3	32.0	23.7	22.3	70.5	55.7	69.6	65.3	5	14	12	15	5	4	24	0	
Apr .....	9	11	14	9	9	14	10	9	5	3.48	1.75	21	6.4	7.0	5.7	6.4	36.0	37.1	44.0	37.7	73.1	47.1	66.9	62.4	6	12	12	14	0	2	0		
May .....	27	7	9	11	11	9	8	13	4	9.76	2.91	8	6.8	8.0	6.5	7.1	44.0	45.7	47.2	43.6	70.1	59.4	74.6	71.1	4	11	16	19	0	0	1		
June .....	23	14	4	6	10	8	5	15	5	7.75	.94	17	6.4	6.7	4.3	5.8	56.3	57.8	59.8	58.0	84.1	58.0	80.0	74.0	6	12	12	15	0	0	1		
July .....	13	11	4	7	10	32	7	4	5	2.37	.74	29	3.0	5.4	6.1	4.9	5.5	61.4	62.5	64.5	62.8	82.6	54.4	77.5	71.5	7	14	10	11	0	0	9	
Aug .....	15	10	5	10	15	16	9	5	8	2.83	1.31	14	5.7	7.0	4.2	5.7	57.4	59.3	60.7	59.1	84.1	53.1	77.1	71.4	6	16	9	11	0	0	1		
Sept .....	19	12	10	7	14	9	8	5	6	1.88	.78	23	24	5.7	4.9	3.5	4.7	46.7	46.3	48.3	47.1	80.4	48.0	73.5	74.0	11	11	8	7	0	0	1	
Oct .....	18	9	8	22	15	5	7	8	1	4.42	1.62	1, 2	6.1	7.6	5.0	6.2	38.5	40.3	41.2	40.0	81.7	61.8	78.6	74.0	7	11	13	15	0	1	0		
Nov .....	17	3	3	7	12	19	12	17	2	1.32	.59	1, 5	3.1	4.8	2.8	3.6	25.6	26.6	28.1	26.8	71.8	49.8	68.6	63.4	14	12	4	6	3	18	0		
Dec .....	24	9	3	9	6	13	10	17	5	1.08	.40	6	4.2	6.1	3.5	4.6	15.4	18.5	17.2	17.0	72.3	57.1	68.5	66.0	11	14	6	10	12	26	0		
Sums ..	235	114	81	117	118	150	92	143	45	39.69	.....	.....	64.1	78.2	56.0	66.2	401.0	431.5	444.1	2424.6	907.6	603.5	864.0	813.8	96	147	122	141	59	128	11		
Means ..	21	5.10	4.7	4.10	7.10	8.13	7.8	4.13	14.1	.....	.....	.....	5.3	6.5	4.7	5.5	33.4	36.0	36.8	35.4	75.6	55.8	72.0	67.8	26	340	333	438	616	235	13.0		
										Percentages.																							

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.53 a. m., 1.53 p. m., and 9.53 p. m., local time.  
 Correction for instrumental error of barometer used: From 5.53 a. m., January 1, to 9.53 p. m., December 31, inclusive, +.012 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.970; February, 0.970; March, 0.980;  
 April, 0.830; May, 0.890; June, 0.880; July, 0.880; August, 0.880; September, 0.890; October, 0.920; November, 0.950; December, 0.980.

F. W. CONRAD,  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DETROIT, MICH.

[Latitude, 42° 20' N.; longitude, 83° 3' W. Magnetic variation, 0° 15' E. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 71 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.											
Month.	Washington time.			Monthly mean.			Range.	Washington time.			Monthly mean.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Total.	Miles.	Maximum hourly velocity during month.			
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Highest.		In.	In.	In.	Date.	Minimum.	Maximum.	Date.	Minimum.	Maximum.			Range.	Abol.	to			11 a. m.	3 p. m.	7 a. m.	3 p. m.
1883.																											
Jan.	29.405	29.366	29.397	29.389	29.813	428.767	In.	In.	In.	20	1.066	19.3	25.1	20.7	21.750.0	30	-8.0	22.58.0	28.2	15.0	2.908	2.806	3.036	8.750	33	S.S.W.	13.31
Feb.	29.500	29.473	29.482	29.485	29.911	225.955	24	1.956	22.9	22.9	22.9	22.9	26.0	26.0	26.357.8	16	6.2	6.51.6	31.5	18.2	1.897	2.380	2.204	6.641	31	S.	16
Mar.	29.202	29.253	29.287	29.277	29.774	228.619	10	1.125	25.9	34.7	23.7	23.7	23.7	23.7	40.158.5	14	3.0	20.53.5	38.5	21.2	1.897	2.539	2.569	7.025	35	N.	18
Apr.	29.276	29.241	29.273	29.263	29.531	228.796	11	1.735	41.4	52.4	44.9	44.9	44.9	44.9	43.278.5	14	18.5	1.90.0	65.8	36.2	1.982	2.685	2.477	7.300	36	N.W.	11
May	29.247	29.201	29.230	29.220	29.568	228.856	14	1.712	49.6	60.0	52.5	52.5	52.5	52.5	40.577.0	19	32.1	22.44.5	64.2	44.1	2.101	3.225	2.872	8.258	40	S.	10
June	29.225	29.184	29.212	29.210	29.661	228.785	10	1.670	63.8	73.1	66.7	66.7	66.7	66.7	47.101.0	23	46.0	9.41.0	80.3	58.0	1.280	2.134	1.869	5.773	31	S.W.	17
July	29.255	29.267	29.284	29.282	29.525	1828.837	12	1.568	66.5	76.8	69.6	69.6	69.6	69.6	71.091.0	22	50.0	9.41.0	76.3	61.3	1.618	2.433	2.004	6.107	31	S.W.	12
Aug.	29.384	29.339	29.367	29.363	29.579	27.971	2	1.508	61.1	74.6	67.7	67.7	67.7	67.7	67.789.0	22	48.6	14.40.4	71.7	57.0	1.679	2.876	2.095	6.136	28	S.E.	22
Sept.	29.397	29.342	29.366	29.363	29.744	928.803	24	1.941	54.9	65.8	58.3	58.3	58.3	58.3	58.312.0	15	20.8	26.51.2	68.2	50.2	1.739	2.751	2.146	6.030	28	S.W.	22
Oct.	29.420	29.391	29.398	29.403	29.929	1628.578	29	1.351	47.4	53.2	49.9	49.9	49.9	49.9	50.878.0	9	34.4	16.43.0	58.0	44.6	2.128	2.707	2.330	7.165	32	S.E.	18
Nov.	29.366	29.338	29.359	29.354	29.885	228.761	21	1.124	40.8	47.1	43.5	43.5	43.5	43.5	43.867.0	22	14.1	16.53.0	51.7	36.9	2.054	3.070	2.830	8.554	33	S.W.	9
Dec.	29.352	29.320	29.358	29.343	29.807	2228.876	27	.971	31.3	36.1	33.0	33.0	33.0	33.0	33.558.0	7	11.0	22.23.47.0	40.6	26.0	2.236	2.905	2.544	7.685	28	S.S.E.	7.23
Sum.	352.159	351.725	352.013	351.963	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	572.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean	29.347	29.310	29.324	29.320	29.929	116.28	578.729	.....	.....	.....	.....	.....	.....	.....	47.791.0	122	-8.0	\$22	55.9	39.1	24.230	31.603	29.102	84.914	.....	.....	.....
																											Averages.

§ January.

† July.

† October.

\* One 7 a. m. observation missed.

### REPORT OF THE CHIEF SIGNAL OFFICER.

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[illegible]

\*One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time. Correction for instrumental error of barometer used: From 6.36 a. m., January 1, to 10.36 p. m., December 31, inclusive,  $+0.017$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.760; February, 0.750; March, 0.750; April, 0.730; May, 0.730; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.740; December, 0.760.

CHAS. K. CUNNINGHAM,  
*Private, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

DODGE CITY, KANS.

[Latitude, 37° 49' N.; longitude, 100° W. Magnetic variation, 12° 30' E. Elevation of barometer above sea-level, 2,517 feet. Elevation of exposed thermometer above ground, 31 feet. Elevation of rain-gauge above ground, 38 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.															
Washington time.			Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering thermometers.				Mean maximum.			Mean minimum.			Washington time.				Total.		Maximum hourly velocity during month.	
7 p. m.	8 p. m.	11 p. m.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.	W.	D.			
1883.																																			
Jan.	27.457	27.417	27.470	27.449	27.798	22.28	23.8	12	1.850	14.2	30.2	31.9	°	°	°	°	°	°	9	20.0	19.70	0	34.5	10.2	21.763	1.883	42.006	45.791	43	E.	18				
Feb.	27.588	27.542	27.598	27.598	28.141	4.28	7.77	15	1.864	18.0	24.9	25.7	°	°	°	°	°	°	28	30.0	4.27	0	37.9	15.4	2.168	2.811	2.431	7.210	38	N.W.	2				
Mar.	27.449	27.409	27.437	27.432	28.033	3.28	6.88	18	1.045	22.3	40.9	42.0	°	°	°	°	°	°	22	15.0	13.57	0	51.7	28.4	2.276	2.795	2.445	7.628	46	N.W.	18				
Apr.	27.255	27.238	27.244	27.247	27.898	15.28	8.15	21	1.581	43.2	63.3	63.4	°	°	°	°	°	°	18	25.0	9.54	0	62.9	42.4	2.864	3.225	2.758	10.515	64	S.	20				
May	27.321	27.298	27.308	27.305	27.644	10.28	6.55	17	1.989	50.7	71.9	71.9	°	°	°	°	°	°	22	25.0	9.53	0	74.5	49.3	2.459	3.204	2.746	9.708	54	W.	17				
June	27.374	27.381	27.381	27.385	27.583	29.28	8.93	11	1.590	62.4	80.2	80.2	°	°	°	°	°	°	20	45.0	10.49	0	83.6	59.5	2.832	3.409	2.409	6.538	56	( )	1	1			
July	27.437	27.404	27.419	27.420	27.683	17.27	11.8	13	1.551	63.5	80.2	74.2	°	°	°	°	°	°	20	45.0	8.43	0	88.6	66.4	2.147	3.235	2.409	12.089	43	SW.	15				
Aug.	27.489	27.485	27.484	27.488	27.610	28.27	10.9	21	1.441	64.5	79.7	71.0	°	°	°	°	°	°	31	63.0	23.39	0	92.4	63.4	2.456	3.185	2.444	8.846	70	N.W.	9				
Sept.	27.497	27.489	27.484	27.483	27.817	26.27	14.7	13	1.670	56.0	73.9	63.5	°	°	°	°	°	°	1	38.5	23.57	0	75.0	54.0	2.844	3.081	2.590	8.355	40	N.E.	4				
Oct.	27.408	27.398	27.418	27.407	27.901	31.24	9.81	1	1.940	44.9	57.8	48.7	°	°	°	°	°	°	1	38.5	23.64	0	58.0	43.0	2.043	3.397	2.839	9.729	44	E.	20				
Nov.	27.450	27.416	27.449	27.438	28.013	12.28	6.29	26	1.084	32.2	53.6	38.6	°	°	°	°	°	°	30	14.0	14.59	0	53.5	29.1	2.031	2.877	2.832	7.740	44	N.E.	13				
Dec.	27.463	27.432	27.468	27.461	27.961	14.28	8.81	26	1.180	38.2	43.4	33.9	°	°	°	°	°	°	1	2.0	31.65	0	43.2	24.5	2.064	2.719	2.872	7.055	44	N.W.	26				
Sums.	328.187	328.683	329.131	329.057						514.9794	7.908	9.6125								758.5485	5	48.5	5	29.247	37.519	37.426	104.192								
Means.	27.432	27.404	27.428	27.421	28.141	4	28.315	23		42.9	60.4	49.9	51.1	99.0						119			63.0	40.5	437.23	138.63	118.8								

! Two 7 a. m., one 3 p. m., two 11 p. m. observations missed.

\* One 7 a. m. observation missed.

\* Nine observations missed.

\* Eight observations missed.

! Twenty-six observations missed.

\* For 25 days.

\* No record.

\* February.

\* April.

\* July.

\* January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.				Number of days—					Remarks.													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive hours hourly measurements.			Cloudiness (in tenths).			Dew-point.					Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.	
											Largest amount.	Date.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.		11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.								
1883.																																	
Jan. 1	12	8	10	7	4	14	6	25	2	0.44	0.12	16		4.1	5.3	3.8	4.4	7.8	16.7	13.3	12.6	76.6	60.4	69.5	68.8	11	10	7	13	29	0		
Feb.	11	7	8	15	5	7	9	9	1	1.42	1.13	13		3.5	5.0	2.4	3.6	12.2	16.0	15.4	14.5	78.9	49.8	66.8	65.2	15	8	5	4	10	25	0	
Mar.	18	13	13	7	10	9	9	10	5	0.42	0.22	24		4.1	4.5	3.7	4.2	24.7	24.4	24.4	24.5	74.0	43.4	55.3	57.6	14	10	7	4	0	19	0	
Apr. 2	11	8	5	7	10	21	15	13	4	2.40	1.49	20		3.1	4.5	2.8	3.5	34.1	33.8	34.8	34.2	71.7	39.2	55.3	53.4	13	15	1	6	0	1	0	
May	11	13	5	6	5	20	14	14	5	5.41	3.65	16		3.3	4.4	3.4	3.4	42.9	44.3	43.5	44.2	75.9	39.3	62.7	59.3	12	16	3	9	0	0	0	
June	7	5	11	11	15	29	16	2	4	4.31	1.41	8		4.2	4.0	3.3	3.8	58.0	58.6	60.2	58.9	86.2	50.3	72.9	69.8	11	17	2	10	0	0	6	
July	5	8	3	10	16	35	12	2	2	2.61	0.81	6		4.1	4.4	4.7	4.4	58.5	60.6	60.5	59.9	71.8	44.7	62.8	59.8	12	12	7	18	0	0	15	
Aug.	4	11	9	49	11	7	1	1	0	0.66	1.64	11		4.2	4.6	4.7	4.2	61.9	64.3	64.5	63.6	91.4	61.5	82.6	77.8	12	12	7	11	0	0	3	
Sept.	5	12	5	36	9	3	17	0	1	1.32	0.58	13		4.6	4.0	2.3	3.6	50.6	51.5	52.6	51.6	82.6	47.9	71.2	67.2	12	15	3	7	0	0	1	
Oct.	21	9	11	22	4	1	7	15	3	3.32	1.48	16		1.7	5.6	6.5	4.5	39.3	40.7	40.4	40.1	81.1	57.7	71.6	70.1	8	12	11	10	0	1	0	
Nov.	9	4	9	17	15	7	16	7	16	6	0.12	0.12	4		1.5	3.0	1.3	1.9	26.2	27.5	28.5	27.4	79.0	39.6	65.0	61.2	29	10	0	2	0	18	0
Dec.	7	6	3	12	8	7	15	22	13	1.07	0.64	5		5	3.1	5.4	3.1	3.9	21.5	25.0	25.5	24.0	75.4	52.9	74.9	67.7	11	15	5	4	27	0	
Sums	121	104	87	199	111	160	102	158	47	28.50	.....	.....	.....	46.1	54.4	39.0	46.4	437.7	463.4	465.5	453.5	944.6	586.7	808.6	779.9	151	152	58	83	27	120	25	
Means	Percentages.																																
	11.19 68.0 18.3 10.2 214.7 9.4 14.5 4.3 3.8 4.5 3.2 3.8 36.5 38.6 38.8 38.0 78.7 48.9 67.4 65.0 41.8 42.1 116.1 122.7 77.4 33.1 6.8																																

<sup>1</sup> Two 7 a. m., one 3 p. m., two 11 p. m. observations missed.

<sup>2</sup> One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.27 a. m., 1.27 p. m., and 9.27 p. m., local time.

Correction for instrumental error of barometer used: From 5.27 a. m., January 1, to 9.27 p. m., December 31, inclusive, +.023 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.76; February, 2.74; March, 2.73; April, 2.64; May, 2.55; June, 2.51; July, 2.50; August, 2.48; September, 2.55; October, 2.59; November, 2.74; December, 2.80.

J. C. L'ANOUETTE,  
Brevet, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

DUBUQUE, IOWA.

[Latitude, 42° 30' N.; longitude, 90° 44' W. Magnetic variation, 8° 15' E. Elevation of barometer above sea-level, 665 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 43 feet.]

Barometer (corrected for temperature and instrumental error only).														Temperature.					Wind.						
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Total.	Miles.	Direction.	Maximum hourly velocity during month.	
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.		Maximum.	Date.	Minimum.			Date.	Absolute range.	7 a. m. to 11 p. m.					3 p. m. to 7 a. m.
1883.																									
Jan.	29.407	29.384	29.409	29.400	29.809	23.28.097	30	1.172	5.4	14.7	10.4	10.236.0	12.13	26.2	21.02.2	19.7	0.1	764	1.176	1.075	3.015	24	W.	13.21	
Feb.	29.533	29.507	29.524	29.521	29.891	17.28.785	16	1.206	12.7	24.4	19.3	18.847.2	28—15.0	4.8	1.02.2	27.2	8.2	659	1.884	1.949	2.492	22	W.	16	
Mar.	29.345	29.314	29.339	29.333	29.839	7.28.081	17	1.178	25.5	38.4	30.8	30.958.7	17	4.8	7.53.9	39.4	21.9	756	1.460	1.364	3.580	23	N.E.	18	
Apr.	29.216	29.178	29.192	29.185	29.564	2.28.070	10	.894	42.3	57.0	49.8	49.777.8	13	25.7	1.52.1	60.9	39.2	1,284	1.950	1.764	4.998	31	E.	22	
May	29.216	29.184	29.207	29.206	29.553	11.28.754	14	.799	49.8	60.4	53.7	54.833.6	18	31.7	21.51.9	64.3	45.2	973	1.558	1.492	4.023	26	S.	18	
June	29.221	29.193	29.197	29.204	29.509	1.28.883	11	.626	61.8	74.6	66.3	67.734.0	29	50.0	1.44.0	77.5	58.7	800	1.622	1.411	3.893	24	S.W.	11	
July	29.286	29.268	29.254	29.269	29.615	18.28.944	12	.671	66.2	80.1	71.3	72.596.0	2	50.8	1.84.5	82.6	62.5	1,028	1.555	1.379	3.902	26	N.W.	20	
Aug.	29.383	29.345	29.347	29.358	29.619	6.28.994	21	.625	61.4	76.6	67.6	68.591.8	19	49.3	2.42.5	78.6	58.0	657	1.426	1.154	3.237	17	S.	22	
Sept.	29.378	29.342	29.362	29.361	29.761	9.28.919	24	.842	51.6	67.8	56.9	58.84.0	15	34.5	9.49.5	69.8	48.1	622	1.281	1.130	3.033	20	N.W.	20	
Oct.	29.407	29.370	29.389	29.390	29.891	20.28.765	29	1.126	44.2	53.7	48.2	48.784.8	8	31.2	1.53.6	55.9	42.7	1,019	1.519	1.332	3.870	31	N.W.	15	
Nov.	29.363	29.316	29.322	29.334	29.899	15.28.770	23	1.129	33.2	44.2	38.1	38.562.0	4	25	7.2	16.54.8	47.6	30.2	1,356	1.785	1.505	4.646	28	N.W.	15
Dec.	29.346	29.340	29.366	29.351	29.764	22.28.712	17	1.082	23.6	31.2	29.8	27.957.7	1	—5.8	19.03.5	35.6	18.6	1,355	1.439	1.365	4.196	22	S.	17	
Suma.	352.101	351.751	351.906	351.922	.....	.....	.....	.....	477.1	621.0	539.7	545.9	.....	.....	.....	659.1	433.4	11,273	17,655	15,920	44,848	.....	.....	.....	
Means.	29.342	29.313	29.326	29.327	29.901	*17.28.670	†10	.....	39.8	51.8	45.0	45.596.0	†2	—26.2	†21	.....	54.9	36.1	939.4	1,471.2	1,336.7	.....	.....	.....	.....

\* February.

† April.

‡ July.

§ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—				Remarks.								
	North. Northeast. East. Southeast. South. Southwest. West. Northwest.								Total amount.		Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths.)			Dew-point			Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.40 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	
											Largest amount.	Date.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.									3 p. m.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		In.	In.	In.	In.	In.	In.	In.	
1883.																															
Jan.....	6	4	3	7	6	20	21	19	1.50	31	0	10	5.2	3.1	3.1	58.4	53.0	57.8	56.4	0	0	0	0	0	0	0	0	0	0	0	
Feb.....	6	3	5	3	9	14	17	10	2.60	64	2	5	5.3	2.2	2.2	63.2	54.8	60.4	60.7	0	0	0	0	0	0	0	0	0	0	0	
Mar.....	6	8	3	9	6	11	23	13	0.32	16	25	26	4.6	16.2	19.9	67.9	52.1	65.4	61.8	12	13	6	6	3	0	0	0	0	0	0	
Apr.....	9	10	13	9	9	15	7	6	1.93	72	14	5	5.0	30.7	32.4	64.4	43.3	59.5	55.7	12	13	10	7	0	0	0	0	0	0	0	
May.....	13	7	10	6	12	16	14	12	1.13	10	9	6	6.0	41.5	40.9	74.0	53.7	68.7	65.5	8	10	13	16	0	0	0	0	0	0	0	
June.....	11	7	20	3	12	14	12	2	5.34	126	11	12	7.3	4.1	5.5	78.1	53.4	72.7	67.4	3	18	9	13	0	0	0	0	0	0	0	
July.....	17	5	3	5	25	22	11	13	2.90	31	23	4	5.7	4.1	6.0	77.9	51.7	74.2	67.9	8	17	7	6	0	0	0	0	0	0	0	
Aug.....	11	4	10	11	18	10	7	18	2.70	19	19	4	5.3	3.7	5.4	70.1	47.1	71.9	66.0	13	11	7	6	0	0	0	0	0	0	0	
Sept.....	10	5	9	17	10	9	5	22	2.09	85	23	24	4.4	3.8	4.8	81.0	45.0	72.8	66.5	4	12	15	16	0	0	0	0	0	0	0	
Oct.....	15	16	10	18	10	0	11	10	3.44	112	7	4	7.3	6.5	7.1	78.0	54.7	70.3	67.7	9	13	8	8	15	0	0	0	0	0	0	
Nov.....	1	0	0	13	28	8	21	21	1.65	58	4	5	4.8	5.0	4.1	68.7	48.7	63.8	60.2	7	11	12	8	11	12	29	0	0	0	0	
Dec.....	14	2	4	6	18	8	21	20	1.88	45	17	16	5.1	12.9	15.6	65.5	53.4	63.8	60.7	105	154	106	129	63	131	7					
Sums ..	107	74	72	117	162	118	157	197	91	39.57	.....	64.3	71.354	0.63	3.372	1.392	8.41	9.392	4.854	2.611	5.603	9.756	5.105	154	106	129	63	131	7		
Means ..	0.86	8.6	8.6	6.10	7.14	8.10	8.14	2.18	0.8	3	.....	5.4	5.9	4.5	5.3	31.0	32.7	34.3	32.7	71.2	51.0	67.0	63.1	28.842	229	0.35	317	335	91.0		
	Percentages.																			Percentages.											

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time.

Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m., December 31, inclusive,  $\pm 0.00$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.77; February, 0.76; March, 0.75; April, 0.73; May, 0.70; June, 0.69; July, 0.69; August, 0.69; September, 0.70; October, 0.72; November, 0.76; December, 0.77.

JAMES HARRY SMITH,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

**DULUTH, MINN.**

[Latitude, 46° 48' N.; longitude, 92° 8' W. Magnetic variation, 10° 15' E. Elevation of barometer above sea-level, 687 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 66 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.				Maximum hourly velocity during month.									
Washington time.				Monthly mean.				Self-registering thermometers.				Washington time.				Washington time.				Miles.		Direction from—					
7 a. m.	3 p. m.	11 p. m.		Highest.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Minimum.	Date.	Mean maximum.	Mean minimum.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Miles.		Date.
1883.																											
Jan	28.324	28.315	28.347	28.322	28.363	3.28.06	9	1.167	7.5	1.4	1.828	0	19	35.0	22.63	0	11.3	0.2	2.038	2.321	2.039	2.321	6.223	59	NW.	10	
Feb	28.438	28.391	28.410	28.413	28.368	2.28.46	16	1.041	4.7	13.6	12.9	0.48	28	37.0	17.5	0	22.6	0.7	1.704	1.890	2.037	1.890	6.921	44	NW.	16	
Mar	28.294	28.284	28.324	28.313	28.342	7.28.29	17	1.548	16.1	23.4	22.2	22.6	0.62	0	7.05	2	32.6	11.7	2.455	2.616	2.455	2.616	7.758	44	NW.	10	
Apr	28.207	28.193	28.226	28.184	28.276	2.28.46	15	1.099	36.7	44.3	39.8	40.3	0.62	0	17	18.6	47.5	32.7	2.904	2.915	2.614	2.915	6.553	58	NE.	22	
May	28.218	28.211	28.226	28.206	28.247	2.28.55	18	1.042	44.1	47.8	44.6	45.5	0.71	0	38	32.0	11.50	28.6	2.128	2.081	2.314	2.081	7.523	38	NE.	18	
June	28.165	28.187	28.159	28.151	28.204	25.28.93	11	1.566	67.2	63.8	57.6	60.4	0.92	2	41.3	11.50	67.9	50.0	1.935	1.616	1.851	1.616	6.088	36	NW.	29	
July	28.197	28.174	28.179	28.163	28.204	19.28.75	16	1.766	68.1	71.3	63.6	66.8	0.99	1	47.0	14.52	74.2	57.1	1.935	2.171	2.057	2.171	6.163	36	NW.	4	
Aug	28.263	28.270	28.274	28.273	28.299	28.28.06	21	1.904	50.4	59.6	53.9	62.8	0.85	7	18	48.0	68.0	56.0	1.814	1.632	1.468	1.632	6.239	33	0	10	
Sept	28.330	28.324	28.312	28.312	28.314	8.28.42	8	1.772	50.4	49.6	44.1	47.9	0	11	30.0	28.44	49.8	38.6	1.541	1.952	1.854	1.952	6.494	32	NW.	21	
Oct	28.353	28.323	28.340	28.341	28.301	2.28.02	29	1.273	40.8	37.6	44.1	44.1	0.64	0	21.0	20.44	40.8	38.6	1.832	2.208	2.364	2.208	7.524	32	NW.	17	
Nov	28.275	28.266	28.267	28.266	28.283	28.28.04	17	1.521	35.6	34.2	32.8	33.9	0.64	4	8	28.62	37.2	20.6	1.945	2.171	2.364	2.171	6.136	36	NW.	23	
Dec	28.315	28.290	28.312	28.309	28.373	22.28.71	17	1.156	11.1	13.9	15.9	16.1	0	12	22.0	19.73	26.8	7.1	2.014	2.167	2.201	2.167	6.382	38	NW.	23	
Sums	351.309	351.018	351.213	351.201					405.6	513.1	447.4	455.4					551.1	1352.2	22.793	20.588	24.571	24.571	893.2				
Means	28.281	28.292	28.268	28.267	28.286				3.8	42.6	37.3	38.0	0.90	0	35.0	0.22	45.9	20.4	1.990	1.921	2.157	2.157	7.048	2			1 January.
																											1 July.
																											1 March.
																											• November

Month.	Winds at 7 a. m., 3 and 11 p. m., direction, force, and number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—						Remarks.									
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.		Any 3 consecutive hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).					Clear.	Partly.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.		
										Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.
1883.																															
Jan.....	0	4	4	0	20	19	28	13	9	1.12	0.23	9.10	1.1	6.3	2.9	4.2	0	7.3	2	4.9	0	84.6	65.5	75.8	75.3	31	0	0			
Feb.....	0	5	5	1	16	17	25	4	9	0.78	0.20	16	1	4.3	2.9	4.6	10.3	15.7	14.7	10	80.0	62.0	75.3	72.4	17	11	22				
Mar.....	0	11	4	1	11	11	21	20	7	0.88	0.20	6	1	4.3	3.8	4.6	10.3	15.7	14.7	10	80.0	62.0	75.3	72.4	17	11	22				
Apr.....	0	28	5	0	4	16	14	13	11	1.20	0.37	10	3	5.9	3.5	5.0	28.3	28.5	28.5	20	77.6	56.5	67.7	65.6	16	6	15				
May.....	4	39	2	0	2	17	15	13	11	2.07	1.43	17.18	6	7.2	4.2	5.9	34.4	35.0	34.8	20	72.5	63.4	70.0	67.8	20	10	18				
June.....	3	31	2	1	9	10	6	21	14	1.41	1.18	14.11	4	6.2	3.2	5.0	49.1	50.2	49.7	21	75.6	63.9	78.0	72.5	4	12	0				
July.....	4	24	4	2	14	23	10	16	10	2.48	1.41	20.45	4	6.2	3.2	5.0	53.5	52.8	52.2	22	72.5	63.9	78.0	72.5	12	19	0				
Aug.....	8	21	12	0	2	12	10	17	10	0.98	0.81	22.52	5	5.8	4.0	5.3	53.1	55.0	53.8	22	80.4	67.1	74.8	74.1	13	6	0				
Sept.....	12	16	0	0	2	16	16	26	21	1.15	1.20	21.48	4	7.1	3.9	4.3	44.5	46.1	44.5	23	80.4	67.1	74.8	74.1	13	6	0				
Oct.....	11	20	17	2	4	11	16	11	1	3.19	1.27	7.8	7	7.7	7.7	7.2	34.8	35.8	34.3	23	79.8	65.4	74.9	73.2	18	14	0				
Nov.....	8	6	8	1	6	22	22	16	1	1.63	0.96	25.6	5	5.8	4.9	5.3	29.7	30.3	29.7	22	80.5	69.0	76.5	75.3	4	19	7				
Dec.....	8	4	8	1	10	22	19	20	1	3.02	0.91	9.7	4	5.8	4.9	5.3	29.7	30.3	29.7	22	82.8	69.0	76.5	75.3	8	13	20				
Sums ..	66	209	71	8	92	150	222	155	129	23.20	.....	67.9	71	143.5	62.4	62.7	336.1	351.3	346.6	936.9	875.9	885.0	893.4	93	178	94	141	97	159	2	
Means ..	Percentages.								Percentages.			Percentages.			Percentages.			Percentages.			Percentages.					Percentages.			Percentages.		
	0.19, 1.6, 5.0, 7.8, 4.3, 7.20, 3.14, 2.11, 1								5.6, 5.9, 4.0, 5.2, 27.3, 30.1, 29.3, 28.9			63.0, 73.8, 71.0, 62.5, 5.48, 8.38, 9.26, 6.43, 6			73.8			71.0, 62.5, 5.48, 8.38, 9.26, 6.43, 6			71.0, 62.5, 5.48, 8.38, 9.26, 6.43, 6					71.0, 62.5, 5.48, 8.38, 9.26, 6.43, 6					

**NOTE.**—7 a. m., and 11 p. m., Washington time, correspond with 6 a. m., 2 p. m., and 10 p. m., local time.

**Correction for instrumental error of barometer used:** From 6 a. m., January 1, to 10 p. m. December 31, inclusive,  $+0.005$  inch.

The barometric observations may be reduced to sea-level by adding the constants for the various months: January, 0.810; February, 0.810; March, 0.790; April, 0.770; May, 0.750; June, 0.730; July, 0.720; August, 0.720; September, 0.740; October, 0.760; November, 0.790; December, 0.820.

**N. B. CONGER,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

## EASTPORT, ME.

[Latitude, 44° 54' N.; longitude, 69° 59' W. Magnetic variation, 18° W. Elevation of barometer above sea-level, 61 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 59 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.					Self-registering ther- mometers.			Mean maximum.		Mean minimum.		Washington time.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 a. m.	3 p. m.	11 p. m.						Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	8 p. m. to 11 p. m.	Total.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

\* One 3 p. m. observation missed.

1 February.

1 December.

5 August.

Month.	Winds at 7 a. m., 8 and 11 p. m. Direction; Force; Number of times observed blowing from—								Number of calms.	Rainfall or melted snow.		Washington time.						Number of days—						Remarks.						
	North.		Northeast.		South.		Southwest.			West.		Northwest.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
	Northeast.	North.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.		Any 3 consecutive hourly measure-ments.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.								
1883.																														
Jan.....	13	7	3	5	9	7	23	20	1	3,200.78	21	6.0	6.6	4.5	5.7	6.7	11.2	10.2	9.4	76.7	69.2	76.9	74.3	10	17	24	31	0		
Feb.....	16	6	3	4	10	17	18	20	0	2,631.78	25	5.9	6.0	3.8	5.2	11.3	13.5	12.8	12.6	76.7	68.5	75.8	73.0	7	16	19	27	0		
Mar.....	16	6	3	4	11	12	19	24	0	2,611.42	20	5.5	6.1	5.8	5.6	12.3	16.7	15.3	15.1	71.3	63.5	75.3	70.0	6	13	15	28	0		
Apr.....	16	6	3	3	23	8	6	13	2	2,250.55	5,6	4.8	6.1	4.4	5.1	27.4	30.2	28.8	28.5	71.3	60.6	76.2	74.7	8	14	17	0	1		
May.....	11	15	4	3	33	5	6	13	5	6,603.50	23	5.1	5.8	4.3	5.1	39.2	38.6	37.9	38.5	70.5	64.0	80.1	74.7	8	13	0	0	0		
June.....	5	7	2	3	45	9	4	5	6	5,227.62	20	3.7	4.3	3.4	3.7	50.0	50.0	47.9	49.3	82.5	68.4	80.1	74.7	14	13	0	0	0		
July.....	10	1	1	2	45	7	4	11	10	9,071.28	13	3.4	4.3	3.4	3.4	52.8	54.1	51.7	52.9	80.9	68.5	86.2	78.5	11	16	0	0	0		
Aug.....	9	4	2	2	30	15	11	9	11	0,490.22	8	3.8	4.3	3.4	3.4	52.6	53.2	54.8	53.2	77.8	58.7	73.4	71.6	17	13	0	0	0		
Sept.....	5	6	4	2	34	14	11	12	11	2,491.31	24	3.5	3.8	3.4	3.6	46.7	45.8	45.1	45.9	79.3	59.7	73.2	72.4	15	10	0	0	0		
Oct.....	21	11	4	2	23	7	9	10	7	8,412.95	24	4.1	5.4	3.9	4.5	36.3	38.3	35.8	36.1	78.4	65.0	77.2	73.5	13	11	7	2	0		
Nov.....	7	4	5	3	16	14	14	14	13	8,771.45	27	6.5	6.7	6.1	6.4	31.8	30.8	30.9	31.2	78.4	67.6	77.4	74.5	4	15	11	0	0		
Dec.....	20	7	3	3	12	10	9	25	4	4,430.81	27	7.5	7.2	6.7	7.1	15.0	18.2	17.3	16.8	73.4	74.2	79.6	75.7	3	11	17	20	0		
Sums.....	132	81	48	32	276	125	127	202	71	58,181.8	583	5.8	6.0	5.0	5.8	38.2	39.7	38.5	38.8	78.1	65.1	78.8	73.8	112	165	87	140	74		
Means.....	Percentages.											Percentages.						Percentages.												
	12.17	4.4	4.2	2.5	21.1	4.11	6.18	4.65	.....	.....	.....	4.9	5.7	4.2	4.9	31.8	38.1	32.1	32.3	77.4	65.1	78.8	73.8	8.45	3.23	9.38	4.20	3.38		
	Percentages.											Percentages.						Percentages.												

One 3 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7:40 a. m., 3:40 p. m., and 11:40 p. m. local time.

Correction for instrumental error of barometer used: From 7:40 a. m., January 1, to 11:40 p. m., December 31, inclusive,  $\pm 0.005$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.060; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

D. C. MURPHY

Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

ELLIOTT, FORT, TEX.

[Latitude, 35° 30' N.; longitude, 100° 21' W. Magnetic variation, 11° 45' E. Elevation of barometer above sea-level, 2,650 (B.) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.					Monthly mean.					Range.	Date.	Lowest.	Highest.	Date.	Washington time.			Self-registering ther- mometers.				Mean maximum.	Mean minimum.	Washington time.					Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 P. M.	3 P. M.	11 P. M.	In.	Out.	In.	Out.	In.	Out.	In.						Out.	In.	Out.	In.	Out.	In.	Out.			In.		Out.	In.	Out.				In.	Out.	In.	Out.	In.	Out.	Total.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.

\* For 284 days only. \* For 234 days only. \* Maximum taken from exposed thermometer. \* November. \* April. \* June. \* July. \* January. \* Record incomplete.

B.—Elevation determined by barometer.

### REPORT OF THE CHIEF SIGNAL OFFICER.

501

[illegible]

**Inappreciable.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.28 a. m., 1.28 p. m., and 9.28 p. m., local time.

Corrections for instrumental error of barometer used: From 5.28 a. m., January 1 to 9.28 p. m., December 31, inclusive, +.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.900; March, 2.880; April, 2.780; May, 2.700; June, 2.670; July, 2.640; August, 2.640; September, 2.680; October, 2.790; November, 2.930; December, 2.960.

**J. C. RICKLI,**  
*Private, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1882—Continued.*

## EL PASO, TEX.

[Latitude, 31° 47' N.; longitude, 106° 30' W. Magnetic variation, 12° E. Elevation of barometer above sea-level, 3,764 (B.) feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer (corrected for temperature and instru- mental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Washington time.			Monthly mean.			Highest.				Range.			Washington time.			Self-registering ther- mometers.				Mean maximum.			Mean minimum.			Washington time.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 p. m. <i>I<sub>a</sub></i>	3 p. m. <i>I<sub>p</sub></i>	11 p. m. <i>I<sub>w</sub></i>	Date.	Lowest. <i>I<sub>a</sub></i>	Date.	Range. <i>I<sub>w</sub></i>	Monthly mean.	Month- ly mean.	Date.	Minimum.	Date.	Absolute range.	Maximum.	Month- ly mean.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. <i>I<sub>a</sub></i>	7 p. m. <i>I<sub>p</sub></i>	3 p. m. <i>I<sub>w</sub></i>	Total. <i>Miles.</i>	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

\* November.

† April.

‡ June.

§ January.

B.—Elevation determined by barometer.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 con- secutive 8-hourly measure- ments.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	
										7 a. m.	3 p. m.		11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										
1883.																																
Jan.....	2	3	1	7	2	0	25	33	20	.10 .08	5	2.1	3.0	1.1	2.1	21.5	22.8	18.3	20.9	65.9	20	10	1	3	0	0	0	0	0	0		
Feb.....	2	6	11	4	1	5	17	30	14	.40 .13	25	5.2	4.8	4.3	4.6	37.3	29.0	25.7	37.3	62.4	10	12	1	0	0	0	0	0	0	0		
Mar.....	9	5	6	4	1	3	28	16	20	2.09 1.33	7	4.3	5.2	2.8	4.1	33.4	32.4	30.8	32.3	59.3	10	9	1	0	0	0	0	0	0	0		
Apr.....	2	6	11	3	4	1	10	21	15	.10 .10	5	1.8	2.4	0.5	1.6	25.4	17.9	21.7	42.0	35.1	20	2	1	0	0	0	0	0	0	0		
May.....	5	1	14	9	2	17	20	5	20	.02 .02	16	1.4	1.7	0.9	1.3	34.8	30.1	32.9	32.8	41.0	26	2	1	0	0	0	0	0	0	0		
June.....	0	5	14	11	3	9	7	20	21	.04 .02	21	1.2	2.0	2.9	2.8	45.5	42.7	38.1	43.1	18.9	24	9	1	0	0	0	0	0	0	0		
July.....	2	2	17	15	5	1	7	18	26	2.84 1.17	9, 10	2.0	2.9	2.8	2.6	55.3	56.7	56.3	56.1	54.6	18	13	0	0	0	0	0	0	0	0		
Aug.....	0	13	15	16	2	6	4	11	26	1.34 .56	9	2.5	1.8	2.0	2.1	57.0	56.8	55.8	54.9	63.7	24	9	1	0	0	0	0	0	0	0		
Sept.....	0	6	19	18	2	2	5	4	34	2.51 1.07	18, 19	3.2	3.0	2.1	2.8	48.9	50.1	50.8	48.9	64.8	18	9	1	0	0	0	0	0	0	0		
Oct.....	2	2	12	9	1	7	17	16	27	2.03 1.84	2, 3	2.0	2.9	1.6	2.2	41.4	42.5	40.2	41.4	72.2	22	8	1	0	0	0	0	0	0	0		
Nov.....	0	1	21	5	1	3	14	12	33	.61 .53	11	3.9	2.9	1.6	2.8	31.6	32.3	30.1	31.3	74.2	16	11	3	0	0	0	0	0	0	0		
Dec.....	2	5	10	6	1	3	19	18	29	.84 .55	11, 12	3.5	4.2	2.1	3.3	28.9	29.7	29.7	29.4	75.2	15	13	3	0	0	0	0	0	0	0		
Sums ..	28	50	150	107	25	66	181	198	289	12.92 ...	.....	33.1	36.8	23.0	31.2	441.0	443.0	430.0	441.0	672.2	233	104	28	44	0	41	120					
Means ..	2.4	6.1	7.9	8.2	3.6	0.10	8.1	8.1	12.4	.....	.....	2.8	3.1	1.9	2.6	37.6	36.9	35.9	36.8	60.2	31.8	43.3	45.1	63.8	23.5	7.7	12.1	0.11	232.9			
Percentages.																																

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.02 a. m., 1.02 p. m., and 9.02 p. m., local time. Correction for instrumental error of barometer used: From 5.02 a. m., January 1, to 9.02 p. m.; December 31, inclusive, +0.40 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.88; February, 3.88; March, 3.80; April, 3.74; May, 3.64; June, 3.59; July, 3.60; August, 3.60; September, 3.65; October, 3.74; November, 3.85; December, 3.86.

JAMES O'DOWD,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

ERIE, PA.

[Latitude, 42° 7' N.; longitude, 80° 03' W. Magnetic variation, 2° W. Elevation of barometer above sea-level, 581 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.					Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.					Self-registering thermometers.					Washington time.					Total.	Miles.	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 p. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.							11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	3 p. m. to 7 p. m.	11 p. m. to 3 p. m.	7 a. m. to 11 p. m.	3 p. m. to 7 p. m.	11 p. m. to 3 p. m.				7 a. m. to 11 p. m.	3 p. m. to 7 p. m.	11 p. m. to 3 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

\* October.

† August.

‡ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—					Remarks.					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 32°.		
												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 p. m.	3 p. m.										11 p. m.
1883.																															
Jan.....	4	11	9	3	15	24	29	5	2	2.66	0.53	13	9.1	8.7	6.9	8.2	17.3	19.4	18.1	18.3	82.1	73.4	78.7	78.1	0	13	18	32	17	29	0
Feb.....	1	9	3	0	11	14	29	10	7	5.94	3.35	8.4	7.3	6.7	6.5	6.8	20.1	21.0	21.6	20.9	82.6	69.2	77.8	76.5	4	10	14	21	12	26	0
Mar.....	5	17	0	2	15	12	16	15	11	1.25	0.52	27	6.1	5.9	4.5	5.5	18.3	20.4	19.7	76.6	62.7	70.0	69.8	7	14	10	15	11	36	0	
Apr.....	2	27	0	6	18	11	15	6	5	2.91	0.83	26	6.1	5.7	4.7	5.5	34.1	33.7	34.4	74.7	60.6	72.4	69.2	8	13	9	12	1	6	0	
May.....	4	20	0	7	12	20	19	8	3	0.20	1.82	26	6.4	6.0	6.4	6.2	41.7	43.5	41.7	72.5	62.5	74.5	69.8	5	12	13	18	0	0	0	
June.....	6	6	1	9	20	22	12	10	4	3.73	0.90	6.7	5.8	5.5	3.9	5.1	57.1	57.8	57.5	75.7	63.6	77.5	72.3	6	16	9	12	0	0	0	
July.....	6	6	4	1	16	26	21	14	2	2.44	1.45	28	29	4.9	3.2	2.8	55.6	57.3	55.8	73.4	61.4	71.4	68.7	15	13	3	6	0	0	1	
Aug.....	6	12	6	9	14	14	16	14	2	2.44	1.45	28	29	4.9	3.2	2.8	55.6	57.3	55.8	73.4	61.4	71.4	68.7	15	13	3	6	0	0	1	
Sept.....	10	18	9	7	24	7	5	7	3	4.41	1.12	24	25	6.1	3.8	6.1	48.4	51.3	49.7	77.6	65.4	76.8	73.3	8	7	15	15	0	0	0	
Oct.....	10	22	8	9	20	8	8	5	8	4.00	1.06	12	13	7.0	6.6	6.2	46.2	44.5	44.8	81.5	71.0	78.5	77.0	6	8	17	12	0	0	0	
Nov.....	4	2	2	2	35	14	13	18	0	3.47	1.06	21	22	7.4	0.7	5.8	33.6	34.4	34.6	73.8	67.6	72.0	71.1	3	14	13	18	2	8	0	
Dec.....	5	5	2	2	25	24	9	19	0	3.74	0.88	7	8	8.3	7.5	7.4	28.2	28.2	27.9	81.3	78.9	81.1	80.4	1	10	20	21	9	21	0	
Sums ..	60	155	44	59	225	100	183	127	46	44.81	.....	80.4	73.7	65.2	45.7	147.6	646.9	468.9	468.9	3803.2	3803.2	3803.2	3803.2	70	149	146	187	52	120	1	
Means	5.51	2.4	0.5	0.4	2.0	6.17	9.16	7.11	4.2	.....	.....	6.7	6.1	5.4	6.1	38.1	39.7	39.2	39.0	77.5	66.9	75.7	73.4	19	240	840	0.51	2.14	232.9	.3	
Percentages.										Percentages.										Percentages.					Percentages.						

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 6.47 a. m., 2.47 p. m., and 10.47 p. m., local time. Correction for instrumental error of barometer used: From 6.47 a. m., January 1, to 10.47 p. m., December 31, inclusive, +.009 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.770; February, 0.770; March, 0.770; April, 0.750; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.710; October, 0.730; November, 0.760; December, 0.770.

C. A. SHAW, U. S. A.  
Sergeant, Signal Corps, U. S. A.

**APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.***

**ESCANABA, MICH.**

[Latitude, 45° 48' N.; longitude, 77° 5' W. Magnetic variation, 4° E. Elevation of barometer above sea-level, 612 feet. Elevation of exposed thermometer above ground, 38 feet. Elevation of rain-gauge above ground, 25 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.									
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Mean maximum.			Mean minimum.			
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Maximum.	Date.	Minimum.	Maximum.	11 a. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.
1883.																								
Jan	29.375	29.311	29.370	29.352	29.924	428.588	19.136		4.3	15.2	7.6	9.0	32.0	19.30	22.0	22.54	0	1.066	2.000	2.158	5,854	84	SE.	13
Feb	29.401	29.465	29.472	29.922	428.703	428.703	17.117		5.8	19.3	12.4	12.4	37.0	10.21	24.0	10.61	0	1.062	2.002	1.915	5,529	27	N.E.	14
Mar	29.341	29.291	29.343	29.872	428.824	428.718	17.181		10.1	25.7	10.1	12.4	32.0	9.1	16.0	19.67	0	1.068	2.589	2.464	6,711	88	N.W.	18
Apr	29.306	29.276	29.257	29.800	428.718	428.718	19.916		31.1	42.6	34.9	36.7	56.5	19	27.0	1.54	5	1.492	2.771	2.068	6,811	32	N.W.	21
May	29.283	29.256	29.273	29.770	428.588	428.588	19.820		22.9	44.6	22.8	24.3	43.0	28	27.0	1.43	0	1.878	2.738	2.512	7,159	86	N.	24
June	29.250	29.206	29.214	29.618	428.588	428.588	19.758		62.7	61.6	44.6	44.6	43.0	28	42.6	10.35	0	1.065	2.908	2.352	6,608	31	N.	25
July	29.270	29.262	29.238	29.665	428.588	428.588	19.732		52.7	66.8	46.0	46.0	43.0	28	46.0	13.35	0	1.287	2.128	1.938	5,486	31	N.	26
Aug	29.381	29.362	29.371	29.871	428.588	428.588	22.793		52.7	66.8	46.0	46.0	43.0	28	46.0	13.35	0	1.287	2.128	1.938	5,486	31	N.	27
Sept.	29.423	29.391	29.370	29.801	428.588	428.588	22.918		48.2	68.9	51.9	56.7	57.0	1	20.0	29.47	0	1.701	2.512	2.256	6,464	33	N.W.	22
Oct.	29.450	29.432	29.446	29.442	29.966	428.588	15.260		40.4	48.1	43.0	43.8	64.5	9	27.8	20.38	7	2.173	2.471	2.513	7,137	28	N.W.	19
Nov	29.301	29.298	29.297	29.296	29.985	428.588	29.267		30.8	35.8	32.1	32.6	55.0	5	1.5	15.54	5	2.279	2.718	2.468	7,400	38	SE.	18
Dec	29.337	29.337	29.349	29.341	29.888	428.588	17.070		16.8	23.7	18.9	20.1	43.0	7	2.0	19.54	0	2.479	2.730	2.210	7,419	33	N.W.	20
Suma.	352.196	351.906	352.061	352.064	352.064	352.064	352.064		404.1	521.8	439.1	435.0	.....	.....	561.7	7341.9	.....	21,076	28,906	28,927	76,864	.....	.....	.....
																		Averages.						
Means.	29.350	29.323	29.330	29.338	29.966	428.588	17.070		33.7	43.5	36.6	37.9	52.0	728	24.0	10.1	.....	1,765.3	2,468.8	2	2,103.3	.....	.....	.....

March.

June.

October.

February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—						Remarks.								
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Date.	Cloudiness (in tenths).				Dew point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	
									Largest amount.	W. in.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.									Mean.
1883.																															
Jan.....	10	3	2	9	13	10	21	18	7	1.29	23	13	5.7	5.4	5.4	1.7	8.4	1.9	4.0	81.7	74.3	75.5	77.2	6	10	12	17	23	31	9	
Feb.....	10	5	1	5	15	12	18	12	6	1.27	42	18	5.7	5.0	5.6	4.4	12.6	5.8	1.9	78.0	65.0	76.0	73.0	7	10	17	10	23	28	9	
Mar.....	23	2	1	7	20	2	4	20	8	1.33	10	5	5.7	5.7	5.2	4.9	12.6	8.3	5.5	77.9	57.7	70.3	68.7	10	14	7	11	20	31	9	
Apr.....	23	5	13	6	17	4	8	9	10	1.68	78	15	5.2	5.7	5.2	4.4	23.8	26.1	26.6	74.5	58.1	70.3	67.0	9	14	6	10	22	0	0	
May.....	26	4	14	19	0	7	9	7	9	1.96	57	19	5.8	6.3	5.1	5.7	33.6	33.8	33.8	71.5	58.0	71.6	67.0	4	19	8	14	0	0	0	
June.....	24	1	12	28	8	7	7	10	7	1.43	54	17	5.8	5.3	5.6	5.0	50.0	50.9	50.7	79.0	63.2	82.2	74.8	9	13	8	17	0	0	0	
July.....	13	6	9	36	11	7	10	10	10	1.71	60	1	5.9	5.8	5.0	5.6	53.1	53.6	55.9	82.7	66.8	80.6	76.5	7	17	6	12	0	0	0	
Aug.....	21	1	2	10	22	10	7	10	12	1.58	53	1	6.2	5.5	5.2	5.1	53.8	53.1	52.9	83.7	60.8	78.8	74.4	16	13	6	12	0	0	0	
Sept.....	23	3	4	11	20	8	8	10	3	1.89	85	6	4.4	4.7	3.4	4.2	44.5	46.6	45.6	87.9	61.6	82.5	77.3	5	13	18	15	0	0	0	
Oct.....	25	8	6	12	17	6	10	6	6	1.63	125	9	6.3	6.5	5.9	6.2	35.7	33.6	35.9	76.7	70.1	74.9	74.9	1	16	13	18	5	20	0	
Nov.....	5	0	3	2	19	17	14	22	2	1.82	82	6	7.2	6.5	6.0	25.0	24.2	24.7	25.3	79.7	70.1	74.9	74.9	7	10	14	19	0	0	0	
Dec.....	15	0	3	2	19	17	14	22	1	1.67	78	6	6.5	5.5	6.0	12.1	15.6	14.7	14.1	51.1	70.9	79.5	77.2	7	10	14	19	0	0	0	
Sums ..	224	59	40	100	250	88	127	150	7030.02	.....	84	9	63	7.56	4.63	4.338	9373	9357	7356	9901	4764	2919	1881	5	94	161	110	158	96	179	0
Means ..	Percentages.								Percentages.						Percentages.						Percentages.										
	20.5, 6.2, 7.0, 11.1, 61.3, 76.9								5.4, 5.8, 4.7, 5.3, 28.2, 81.2, 29.8, 29.7						80.1, 63.7, 76.6, 73.5, 844, 130, 143, 303, 340, 0.0																

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 6.20 a. m., 2.30 p. m., and 10.20 p. m. local time.

Correction for instrumental error of barometer used: From 6.20 a. m. January 1, to 10.20 p. m. December 31, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.710; April, 0.690; May, 0.660; June, 0.650; July, 0.640; August, 0.610; September, 0.600; October, 0.670; November, 0.700; December, 0.720.

L. M. PINDELL,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

FORT SMITH, ARK.

[Latitude, 35° 22' N.; longitude, 94° 24' W. Magnetic variation, 92° E. Elevation of barometer above sea-level, 440 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).					Temperature.					Wind.											
	Washington time.		Monthly mean.		Range.	Washington time.		Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.						
	7 a. m.	11 p. m.	In.	Th.		7 a. m.	11 p. m.	Monthly mean.	Maximum.	Date.			Minimum.	Date.	Absolute range.		7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.
1883.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	Date.	
Jan.	29.709	29.666	29.684	29.690	30.206	22.23	23.6	12	970	23.8	32.9	33.5	33.5	33.5	28	1,750	1,330	4,231	28	W.	10, 13	
Feb.	29.736	29.758	29.780	29.780	30.301	18.23	14.0	15	1,157	33.8	43.2	40.1	30.7	30.7	22	1,325	1,494	4,218	32	NW.	16	
Mar.	29.611	29.557	29.591	29.590	30.141	3.23	24.172	18	969	40.9	48.2	48.8	48.3	48.3	22	1,155	1,354	4,237	23	N.	6	
Apr.	29.435	29.407	29.431	29.431	29.857	26.23	24.649	22	1,017	53.9	60.0	61.2	58.5	58.5	24	1,041	1,774	4,237	23	S, NW.	14, 15	
May	29.500	29.472	29.474	29.482	29.803	6.23	121	29	682	60.5	77.1	65.0	67.7	67.7	24	1,065	1,883	4,498	36	E.	20	
June	29.517	29.477	29.458	29.493	29.686	1.23	147	0	539	69.8	85.7	74.5	78.9	78.9	36	1,085	1,281	4,919	36	N.	23	
July	29.589	29.554	29.559	29.567	29.829	18.23	310	12	519	73.0	87.0	78.0	79.0	79.0	36	1,623	1,068	2,919	28	N.	23	
Aug.	29.601	29.566	29.578	29.581	29.760	6.23	307	11	341	63.5	77.3	77.3	77.3	77.3	36	1,495	1,061	2,640	28	N.	14	
Sept.	29.615	29.532	29.578	29.582	29.763	5.23	307	13	305	60.4	82.4	68.3	70.4	70.4	20	594	1,112	3,053	20	N.	2	
Oct.	29.571	29.534	29.543	29.556	29.969	31.23	108	28	883	58.9	70.9	61.7	63.8	63.8	20	1,037	1,478	3,769	20	NW.	20	
Nov.	29.607	29.637	29.600	29.605	30.192	12.23	128	21	1,061	43.9	60.8	51.7	52.8	52.8	20	1,135	1,219	3,762	20	W.	21	
Dec.	29.685	29.638	29.663	29.660	30.163	15.23	108	26	1,056	38.2	51.8	42.7	44.1	44.1	26	1,247	1,866	4,592	26	NW.	26	
Sums.	355,340	354,818	355,078	355,062	.....	632.7	816.0	660.8	716.1	.....	876.9	107.1	11,516	17,215	15,937	44,608	.....	.....	.....	.....	.....	
Means.	29.642	29.593	29.590	29.590	30.303	118.23	840	122	.....	82.7	68.0	58.3	50.7	100.3	52.2	.....	Averages.	956.71	1,494.6	1,398.1	.....	.....

\* One 7 a. m. and one 11 p. m. observation missed.

: April.

: February.

: August.

: January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Rainfall or melted snow.			Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Total amount.	Any 3 consecutive 8 hourly measurements.			Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
											Largest amount.	Date.	In.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
1883.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

One 7 a. m. and one 11 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.30 a. m., 1.50 p. m., and 9.50 p. m., local time.

Correction for instrumental error of barometer used: From 7.50 a. m., January 1, to 1.50 p. m., December 31, inclusive, +.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.500; February, 0.500; March, 0.490; April, 0.490; May, 0.470; June, 0.460; July, 0.460; August, 0.460; September, 0.470; October, 0.480; November, 0.490; December, 0.500.

J. B. CAMPBELL,  
Private, Signal Corps, U. S. A.

## REPORT OF THE CHIEF SIGNAL OFFICER.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

**GALVESTON, TEX.**

[Latitude, 29° 18' N.; longitude, 94° 47' W. Magnetic variation, 8° 15' E. Elevation of barometer above sea-level, 40 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 51 feet.]

[illegible]

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Rainfall or melted snow.		Washington time.						Number of days—				Remarks.												
	North.		Northeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Total amount.		Any 3 consecutive 8 hourly measure-ments.	Data.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	
	North.	North-east.	South-east.	South.	South-west.	West.	North-west.	North.	North-east.	South-east.	South.	South-west.	West.	North-west.	7 a. m.	3 p. m.			11 p. m.	Mean.	7 a. m.	3 p. m.		11 p. m.	Mean.	7 a. m.	3 p. m.								11 p. m.
1883.																																			
Jan.	29	9	13	21	6	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Feb.	19	15	10	24	14	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Mar.	14	10	11	24	23	6	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Apr.	9	15	8	21	20	12	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
May	8	10	5	35	20	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
June	2	3	2	26	45	9	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
July	0	2	1	16	47	21	3	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Aug.	6	6	10	16	34	13	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sept.	9	14	13	29	17	3	2	0	8	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Oct.	5	12	13	24	29	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Nov.	9	23	16	17	22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Dec.	22	9	17	12	19	6	4	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sums.	132	127	119	265	306	87	21	25	13	41	11	.....	71.6	65.1	73.3	74.2	80.9	83.1	98	109	100	120	1	6	37	.....	.....	.....	.....	.....	.....	.....	.....		
Means.	12	11	11	20	24	2	1	2	1	2	1	.....	6.0	5.6	61.8	62.4	81.6	80.3	76	32	34	32	9	3	1.6	10.1	.....	.....	.....	.....	.....	.....	.....	.....	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.49 a. m., 1.49 p. m., and 9.49 p. m., local time.

Correction for instrumental error of barometer used: From 5.49 a. m., January 1, to 3.45 p. m., December 31, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

E. O. C. MACINERNEY,  
Sergeant, Signal Corps, U. S. A.



Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Any 3 consecutive hours measure-ments.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Partly.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
											Date.	Total amount.	Largest amount.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.									7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTE.—7 a. m. 8 p. m. and 11 p. m. Washington time, correspond with 6.23 a. m., 2.23 p. m. and 10.23 p. m. local time. Correction for instrumental error of barometer used from 6.23 a. m. January 1, to 10.23 p. m. December 31, inclusive, +.002 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.690; June, 0.680; July, 0.680; August, 0.650; September, 0.660; October, 0.670; November, 0.700; December, 0.710.

JOSEPH E. MUELLER,  
Sergeant, Signal Corps, U. S. A.



Month.	Winds at 7 a. m., 8 and 11 p. m., at Washington time; Number of times observed blowing from—							Rainfall or melted snow.		Washington time.						Number of days—						Remarks.							
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	
									Total amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.
1883.									Largest amount.																				
Jan.....	8	12	11	13	8	13	21	4	1.21 0.98	8	3.1	2.7	3.0	2.3	23.1	27.3	24.5	28.0	71.5	42.7	53.4	57.3	8	9	5	0	18	0	
Feb.....	5	10	23	6	7	4	10	14	1.40 0.59	20	2.4	4.8	4.8	2.7	23.2	31.3	29.0	27.8	61.9	50.9	55.9	55.6	7	13	10	0	10	0	
Mar.....	14	14	9	8	14	9	15	6	1.27 0.66	8	4.6	5.2	3.5	2.5	29.6	37.1	35.5	34.1	60.0	43.9	55.5	53.1	7	14	10	0	0	0	
Apr.....	7	4	13	5	7	26	24	1	0.03 0.03	16	1.3	2.7	1.4	1.9	23.2	23.8	21.6	22.9	43.1	21.6	29.6	31.4	21	9	0	0	0	0	
May.....	14	5	10	8	13	9	20	4	1.16 1.07	16	1.3	2.0	1.4	1.9	23.4	30.5	28.2	29.0	38.3	22.3	27.7	29.6	4	3	4	0	0	18	
June.....	18	2	10	7	11	8	25	2	1.28 1.26	29	0.7	2.4	2.1	1.7	38.8	42.5	41.8	41.0	38.3	21.8	27.7	29.6	22	8	0	0	0	0	
July.....	21	7	20	12	4	5	2	16	2.30 0.62	28	3.1	3.7	3.5	4.4	54.9	54.3	54.3	53.2	39.9	51.7	51.6	51.6	1	0	0	0	10	0	
Aug.....	15	20	12	9	6	6	8	10	1.07 0.95	5	9	1.4	2.3	2.0	37.5	55.9	54.3	54.3	74.8	42.6	56.0	57.3	13	5	14	0	0	0	
Sept.....	11	10	12	26	6	5	10	10	0.42 0.26	2	2.1	2.3	2.3	2.4	33.5	33.0	31.1	32.5	64.0	31.1	40.1	41.7	21	8	1	0	0	2	
Oct.....	15	15	7	14	6	7	14	15	0.21 0.64	2	1.1	2.9	2.6	2.4	26.7	26.7	26.7	23.0	56.6	35.6	42.1	44.8	24	6	5	0	0	0	
Nov.....	12	19	3	25	7	4	12	6	2.0 1.10 1.1	4	1.2	2.5	0.6	1.4	25.0	28.2	26.7	23.0	56.6	35.6	42.1	44.8	24	6	5	0	0	0	
Dec.....	12	11	9	17	13	7	8	16	0.44 0.53	4	3.4	4.3	2.8	3.5	25.4	29.8	29.3	29.3	67.5	44.4	55.8	55.9	14	11	9	1	0	0	
Sums ..	152	129	139	150	86	81	129	136	32 0.45 9.84	937	32	0.45	9.84	937	940.8	842.1	842.1	842.1	937.0	439.2	533.9	544.0	199	118	48	33	0	36	32
Means	Percentages.																												
	13.9 11.1 11.2 11.2 7.7 7.7 9.7 11.3 2.7 3.8 2.9 2.1 3.4 35.1 36.2 35.4 35.8 44.5 35.8 44.5 45.4 53.2 3.13 2.52 7.0 9.8 3																												

NOTE.—7 a. m., 8 p. m., and 11 p. m., at Washington time, correspond with 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time. Corrections for instrumental errors of barometer used: From 4.48 a. m., January 1, to 4.48 a. m., June 15, inclusive, —.001 inch. From 4.48 a. m., August 26, to 8.48 p. m., December 31, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.900; February, 4.800; March, 4.800; April, 4.780; May, 4.610; June, 4.540; July, 4.570; August, 4.570; September, 4.600; October, 4.700; November, 4.540; December, 4.580.

CHAS. A. READ  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

HATTERAS, N. C.

[Latitude, 36° 19' N.; longitude, 75° 49' W. Magnetic variation, 2° 30' W. Elevation of barometer above sea-level, 13 feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).					Temperature.										Wind.						
	Washington time.			Monthly mean.		Highest.		Lowest.		Range.		Washington time.				Self-registering thermometers.		Washington time.			Maximum hourly velocity during month.	
	7 p. m.	3 p. m.	11 p. m.	In.	F.	In.	F.	In.	F.	In.	F.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Abnormal range.	Mean maximum.	Mean minimum.	
1883.																						
Jan.	30.189	30.143	30.163	30.171	30.011	23.28	29.4	9	1.817			41.8	44.4	42.3	42.8	50.0	19	25.0	10, 12	34.0	37.6	0
Feb.	30.206	30.205	30.200	30.239	30.038	23.28	30.6	25	.702			46.5	50.8	47.3	48.2	57.0	10	38.0	27	31.0	54.8	42.6
Mar.	30.025	30.071	30.001	30.002	30.459	5.28	46.8	26	.901			44.5	50.5	45.3	47.1	57.0	19	32.0	24	35.0	54.2	40.1
Apr.	30.022	30.054	30.040	30.015	30.434	4.28	52.3	23	.911			54.6	59.9	54.3	56.8	74.0	13	38.0	3	38.0	61.8	49.4
May.	30.043	30.023	30.046	30.067	30.265	18.38	43.4	31	.831			63.1	68.5	63.6	64.8	73.0	30	51.0	1, 4	28.0	69.8	55.8
June.	30.027	30.023	30.022	30.017	30.307	8.28	22.9	37	.568			74.4	78.2	73.2	75.6	90.0	25	63.0	1, 2	27.0	80.5	70.5
July.	30.053	30.028	30.048	30.043	30.304	21.28	74.7	24	.557			78.6	83.5	76.7	79.6	90.0	20	67.5	25	22.5	85.1	73.5
Aug.	30.014	30.004	30.016	30.008	30.180	5.18	28.781	20	.309			75.9	80.3	74.9	77.0	92.0	1	87.0	13, 31	25.0	82.8	71.9
Sept.	30.037	30.009	30.023	30.023	30.248	27.28	71.8	34	.580			72.1	76.8	71.6	73.8	88.0	17	83.0	18, 10	22.0	78.0	68.9
Oct.	30.114	30.078	30.098	30.097	30.465	17.28	71.8	29	.732			64.2	67.4	63.2	64.9	82.0	2	82.0	23, 27	30.0	70.8	60.1
Nov.	30.214	30.163	30.185	30.187	30.587	16.28	80.6	14	.601			54.0	59.5	54.9	56.1	77.0	11	33.0	16	44.0	68.1	49.7
Dec.	30.162	30.116	30.145	30.141	30.478	7.28	67.8	14	.800			46.0	52.2	48.8	49.8	65.0	8	30.5	18	37.5	56.4	42.8
Sums.	361.169	360.714	361.047	360.974	.....	.....	.....	.....	.....	.....	.....	718.6	772.0	718.3	738.9	.....	.....	.....	.....	.....	304.5	665.9
Means.	30.097	30.060	30.087	30.081	30.608	+2.28	29.4	19	.....	.....	.....	59.7	64.3	59.7	61.2	92.0	1	85.0	110, 12	.....	67.0	85.5

\* February.

† January.

‡ August.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
										Any 8 consecutive hours measure-ments.	Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.									8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

NOTE.—7 a. m. 8 p. m. and 11 p. m. Washington time, correspond with 7.06 a. m. 3.06 p. m. and 11.06 p. m. local time. Correction for instrumental error of barometer used: From 7.06 a. m. January 1, to 11.06 p. m. December 31, inclusive, +.009 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

R. M. CRAWFORD  
*Private, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## HELENA, MONT.

[Latitude, 46° 30' N.; longitude, 113° 4' W. Magnetic variation, 20° 30' E. Elevation of barometer above sea-level, 4,100 feet. Elevation of exposed thermometer above ground, 5.6 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.							Wind.							
	Washington time.					Monthly mean.	Washington time.					Self-registering ther- mometers.				Washington time.			Wind.						
	7 a. m.			3 p. m.	11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total.	Miles.									
	7 a. m.	3 p. m.	11 p. m.														11 p. m. to	3 p. m. to	7 a. m. to	Miles.					
1883.	In.	In.	In.	In.	In.	In.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to	3 p. m. to	7 a. m. to	Total.	Miles.	Direction from—	Date.
Jan.	25.776	25.764	25.749	25.760	25.151	7.25-37.2	11	15.2	21.6	18.7	18.5	50.0	10	34.0	19	84.0	1.371	1.378	1.520	4,269	30	SW.	9		
Feb.	25.889	25.882	25.877	25.883	25.255	26.25-44.3	13	9.1	18.0	15.1	14.1	50.0	22	32.0	3	80.0	1.541	1.671	1.805	2,017	23	SW.	22		
Mar.	25.881	25.799	25.818	25.816	25.229	2.25-41.3	17	8.15	28.3	40.3	33.0	34.2	64.0	22	4.0	26	80.0	1.240	1.894	4,400	36	SW.	8, 19		
Apr.	25.696	25.659	25.669	25.673	25.081	2.927	20	33.9	47.0	40.3	40.4	64.0	28	11.0	1	47.0	1.357	1.688	1,938	4,983	30	SW.	15		
May	25.767	25.728	25.742	25.746	25.116	20.25-37.3	17	7.43	42.5	57.2	49.8	49.8	72.0	20	25.0	4	47.0	1.664	1.592	2,002	5,258	21	N.	1	
June	25.781	25.751	25.750	25.761	25.042	8.25-49.9	10	54.1	69.4	61.8	61.8	84.0	29	37.0	1	57.0	1.337	1.387	1,683	4,387	48	SW.	5		
July	25.871	25.837	25.848	25.852	25.020	6.25-64.1	14	64.5	73.7	67.9	68.7	90.0	18	46.0	6	44.0	77.5	55.5	1,199	2,117	4,473	24	SW.	13	
Aug.	25.876	25.846	25.846	25.856	25.012	27.25-58.8	20	63.9	72.5	67.2	67.9	87.0	15	38.0	22	48.0	77.5	56.3	988	884	1,842	8,209	28	NW.	16
Sept.	25.907	25.879	25.868	25.885	25.368	20.25-59.1	30	52.8	64.5	59.2	58.8	81.0	4.5	39.0	30	42.0	80.3	48.2	855	682	1,035	2,573	23	SW.	16
Oct.	25.751	25.759	25.748	25.753	25.126	10.25-21.8	27	9.13	34.8	41.2	38.9	38.3	68.0	4	23.0	23	45.0	45.8	1,043	1,074	1,231	8,348	28	SW.	28
Nov.	25.780	25.711	25.732	25.724	25.215	12.25-30.0	23	9.25	28.1	38.0	33.0	32.4	60.0	30	14.0	25	74.0	41.7	1,041	1,028	1,244	8,311	21	NW.	20
Dec.	25.803	25.805	25.802	25.808	25.338	31.25-109.25	25	1.167	28.0	29.9	27.4	27.8	52.0	16	-5.5	80	57.5	35.0	1,192	976	1,101	8,269	25	SW.	1
Sums.	300.678	300.414	300.440	300.512	.....	.....	.....	453.2	571.8	513.2	512.7	.....	.....	.....	.....	.....	631.7	404.8	13,919	13,755	17,882	45,556	.....	.....	.....
Means.	25.806	25.784	25.787	25.792	25.808	120.25-154.120	.....	37.8	47.6	43.8	42.7	64.0	130	-24.0	119	.....	51.8	83.7	1,160.0	1,146.2	1,490.2	.....	.....	.....	.....

\* One 7 a. m. observation missed.

† September.

‡ April.

§ June.

|| January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 8 con- secutive 8 hourly measure- ments.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	
										Largest amount.	Date.		7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.									
1883.										In.	In.																						
Jan.....	0	0	0	0	0	60	1	5	26	0.70	0.32	6, 7	8.5	7.8	6.6	7.0	12.5	17.5	14.9	15.0	89.6	84.9	85.4	86.6	2	15	13	28	0	0			
Feb.....	0	0	0	0	0	35	2	6	41	0.73	0.30	14	4.3	5.6	4.1	4.7	6.7	14.5	12.4	11.2	90.5	87.4	89.7	89.2	3	13	14	25	0	0			
Mar.....	0	0	0	0	0	68	1	2	20	0.73	0.41	26, 27	3.8	5.6	4.3	4.6	24.3	34.1	28.9	29.1	85.5	78.9	82.5	82.3	12	7	11	22	0	0			
Apr.....	3	4	0	0	8	54	5	4	14	0.53	0.20	23	5.9	5.7	4.2	5.3	27.0	38.1	33.0	32.7	76.0	73.5	74.1	74.2	4	21	7	13	0	0			
May.....	1	0	4	1	1	61	14	5	8	1.54	0.48	7	4.7	5.9	5.5	5.4	32.7	44.2	39.2	38.7	68.6	63.2	68.2	66.7	9	13	9	9	0	0			
June.....	1	7	1	0	2	64	6	1	8	1.74	0.50	1	3.3	4.4	3.5	3.7	42.9	55.8	50.5	49.7	67.0	63.6	68.6	65.7	11	15	4	9	0	0			
July.....	10	17	11	0	9	68	6	0	0	( )	( )	29	0.9	4.3	2.6	2.6	52.3	53.8	55.0	55.4	65.0	60.6	64.8	63.5	20	10	1	2	0	0			
Aug.....	23	32	0	0	0	42	4	7	0	( )	( )	( )	2.2	4.0	2.4	2.9	47.6	47.3	47.5	57.3	42.9	50.6	49.9	17	11	3	0	0	0				
Sept.....	24	13	2	0	6	39	2	14	2	( )	( )	( )	2.0	3.0	1.8	2.3	37.5	42.1	41.9	40.5	57.3	45.5	53.9	52.2	18	10	0	0	0	0			
Oct.....	28	10	2	0	3	29	2	1	2	0.66	0.27	( )	5.9	6.9	5.8	6.2	29.4	34.0	32.6	32.0	80.1	76.3	78.5	78.3	3	17	11	0	11	6			
Nov.....	28	10	2	0	1	44	1	2	0	0.66	0.27	( )	4.0	5.0	2.9	4.0	20.1	23.8	22.2	22.2	72.3	62.5	66.0	66.9	14	11	5	8	20	0			
Dec.....	34	9	0	0	0	15	16	10	8	1.02	0.48	25, 26	3.4	5.7	4.5	4.5	18.2	19.3	17.9	18.5	71.2	64.5	67.0	67.6	11	12	7	9	27	0			
Sums ..	125	93	25	12	19	564	62	71	123	.....	.....	.....	46.9	63.9	48.2	53.2	235.1	242.8	239.6	239.2	587.9	289.2	847.3	843.1	130	160	74	.....	47	151	4	.....	
Means ..	11.4	8.5	2.8	1.1	2.6	47.5	5.7	6.5	11.2	.....	.....	.....	3.9	5.3	4.0	4.4	29.3	35.8	33.0	32.7	73.3	66.9	70.6	70.3	743	820	8	.....	12	941	41.1	.....	
Percentages.																																	

<sup>1</sup> Gauge unserviceable.

<sup>2</sup> One 7 a. m. observation missed.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 4.40 a. m., 12.40 p. m., and 8.40 p. m., local time.

Correction for instrumental error of barometer used: From 4.40 a. m., January 1, to 8.40 p. m., December 31, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.430; February, 4.400; March, 4.370; April, 4.360; May, 4.170; June, 4.120; July, 4.060; August, 4.090; September, 4.170; October, 4.300; November, 4.380; December, 4.280.

SAMUEL W. MORRISON.

Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

HUBON, DAK.

[Latitude, 44° 21' N.; longitude, 98° 9' W. Magnetic variation, 16° E. Elevation of barometer above sea-level, 1,800 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 36 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.										
Month.	Washington time.			Monthly mean.			Date.	Lowest.	Range.	Washington time.			Self-registering thermometer.			Mean maximum.	Mean minimum.	Washington time.				Total.	Miles.	Direction from—	Date.
	7 p. m.	3 p. m.	11 p. m.	In.	Th.	Ex.				Maximum.	Minimum.	Absolute range.	Date.	Maximum.	Minimum.			Date.	11 p. m.	7 p. m.	3 p. m.				
1882.																									
Jan....	28.714	28.688	28.725	28.700	28.164	327.989	12	1.225	—	0.9	8.3	1.4	2.945.0	9	30.8	3070.3	12.8	—10.5	°	°	°	°	°	°	29
Feb....	28.824	28.794	28.823	28.814	28.397	1738.108	15	1.189	6.6	20.5	11.8	13.048.0	28	31.8	479.8	24.2	zero.	°	°	°	°	°	°	30	
Mar....	28.709	28.691	28.701	28.700	28.319	237.984	17	1.335	32.0	83.0	27.5	27.570.5	17	7.8	1878.8	38.2	18.5	°	°	°	°	°	°	16	
Apr....	28.506	28.480	28.499	28.495	28.132	2427.891	31	1.231	36.5	44.8	44.8	44.779.8	20	23.5	555.8	57.1	34.4	°	°	°	°	°	°	19	
May....	28.550	28.523	28.538	28.537	28.897	1027.708	18	1.189	44.2	57.5	49.6	50.478.8	31	32.0	1046.8	61.8	41.6	°	°	°	°	°	°	21	
June....	28.550	28.538	28.545	28.544	28.778	2428.187	11	0.896	57.5	73.4	68.2	64.794.1	30	34.0	340.1	77.4	62.8	°	°	°	°	°	°	9.13	
July....	28.595	28.575	28.585	28.578	28.905	2828.185	15	0.740	60.9	77.8	67.8	68.799.2	1	45.0	1753.2	81.5	58.2	°	°	°	°	°	°	17	
Aug....	28.646	28.626	28.638	28.633	28.872	2828.092	31	0.780	58.6	76.2	65.3	65.790.6	16	42.7	2247.9	79.8	56.5	°	°	°	°	°	°	22	
Sept....	28.690	28.668	28.683	28.680	28.028	238.368	12	0.865	47.9	64.2	54.5	55.298.0	11	38.2	5959.8	60.1	45.8	°	°	°	°	°	°	23	
Oct....	28.653	28.637	28.656	28.646	28.161	1928.065	17	1.156	38.1	50.5	48.0	48.976.8	6	21.8	2055.0	53.4	35.4	°	°	°	°	°	°	16	
Nov....	28.612	28.577	28.590	28.580	28.210	238.108	25	1.102	24.8	40.4	38.4	31.492.4	2	4.8	1506.7	45.6	18.3	°	°	°	°	°	°	18	
Dec....	28.678	28.658	28.694	28.675	28.257	3127.885	17	1.872	13.8	23.8	15.9	18.897.0	4	30.5	3777.5	31.1	7.0	°	°	°	°	°	°	21	
Suma.	343.780	343.444	343.647	343.806	.....	.....	.....	.....	409.0	583.5	478.7	488.4	.....	.....	.....	631.0	388.0	.....	.....	.....	26.079	32.000	38.400	57.500	.....
Means	28.644	28.620	28.637	28.632	28.319	*237.708	118	.....	84.1	48.5	38.5	40.798.2	11	31.8	54	52.6	28.8	.....	.....	.....	178.3	274.6	313.450.6	.....	.....

† May.

‡ July.

§ February.

• March.

Month	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Number of calms.								Any 2 consecutive hourly measurements.	Total amount.		Cloudiness (in tenths).		Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, corresponds with 5.35 a. m., 1.35 p. m., and 9.35 p. m. local time.

Correction for instrumental error of barometer used: From 5.35 a. m., January 1, to 9.35 p. m., December 31, inclusive, +0.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.540; February, 1.520; March, 1.480; April, 1.450; May, 1.350; June, 1.340; July, 1.320; August, 1.340; September, 1.380; October, 1.430; November, 1.480; December, 1.540.

SAMUEL W. GLENN  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

## INDIANAPOLIS, IND.

[Latitude, 39° 40' N.; longitude, 86° 10' W. Magnetic variation, 4° 45' E. Elevation of barometer above sea-level, 763 feet. Elevation of exposed thermometer above ground, 83 feet. Elevation of rain-gauge above ground, 74 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.																				
	Washington time.			Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering thermometers.			Washington time.			Mean maximum.			Mean minimum.			Washing-ton time.			Maximum hourly velocity during month.		
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	In.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Mean.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.	Date.						
1883.																																				
Jan.	28.320	28.294	28.321	28.312	28.791	28.312	28.791	22.28	664	10	1.127	21.6	28.2	28.6	24.545.0	17	11.0	22.56.0	30.7	16.3	0	1.574	1.787	1.733	5.084	20	W.	31								
Feb.	28.446	28.405	28.417	28.423	28.883	28.423	28.883	18.28	887	24	.966	28.7	34.7	32.6	32.072.0	16	4.0	108.0	41.0	22.1	1.246	1.369	1.176	3.791	21	NW.	26									
Mar.	28.222	28.189	28.209	28.207	28.693	28.207	28.693	8.28	752	10	.941	30.8	42.1	35.3	38.168.4	18	12.0	20.56.4	45.1	27.0	1.246	1.369	1.176	3.791	21	NW.	26									
Apr.	28.135	28.120	28.130	28.136	28.408	28.136	28.408	3.28	738	22	.762	47.1	60.0	52.9	63.383.3	14	30.4	21.54.9	63.0	43.9	1.437	1.910	1.604	4.941	26	NW.	15									
May	28.158	28.120	28.143	28.140	28.517	28.140	28.517	6.28	695	14	.822	55.8	67.5	59.4	60.982.8	9	35.0	22.47.8	70.2	50.9	1.217	1.948	1.609	4.862	23	W.	10									
June	28.161	28.123	28.140	28.140	28.513	28.140	28.513	1.28	748	10	.765	67.0	77.9	69.6	71.588.0	17	50.0	1.39.0	78.7	62.5	939	1.583	1.451	1.451	8.294	32	NW.	12								
July	28.251	28.219	28.226	28.222	28.523	28.222	28.523	18.28	907	12	.616	70.7	81.6	72.9	75.192.0	3	56.8	31.35.2	83.4	65.7	727	1.876	1.191	1.191	8.294	32	NW.	12								
Aug.	28.288	28.255	28.268	28.270	28.439	28.270	28.439	6.28	904	1	.425	64.0	71.6	68.9	70.491.0	19	22.0	3.38.0	78.9	60.8	519	1.092	934	2.545	26	W.	23									
Sept.	28.280	28.231	28.249	28.253	28.595	28.253	28.595	9.28	895	24	.700	58.2	71.6	61.8	63.287.0	2	40.4	20.48.6	72.9	54.0	498	1.074	737	905	1.840	16	W.	30								
Oct.	28.285	28.270	28.285	28.280	28.694	28.280	28.694	16.28	628	20	1.068	50.7	59.5	54.2	54.881.0	9	35.0	16.48.0	61.0	48.2	641	1.074	729	2.444	20	NW.	31									
Nov.	28.330	28.298	28.306	28.311	28.884	28.311	28.884	10.28	819	21	1.045	40.7	50.2	44.2	45.065.0	20	22	10.0	16.56.0	37.1	37.1	1.226	1.459	4.277	28	NW.	26									
Dec.	28.281	28.258	28.268	28.270	28.620	28.270	28.620	22.28	725	10	.901	30.7	38.6	33.9	34.462.0	6	9.0	17.53.0	42.2	26.8	1	1.331	1.778	1.467	4.576	24	NW.	27								
Sum.	351.177	350.763	350.962	350.860	.....	.....	.....	.....	.....	.....	562.0	892.3	808.3	631.2	.....	.....	.....	730.8	514.8	.....	12,742	18,302	15,883	46,927	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
Means.	28.265	28.263	28.246	28.249	28.883	28.249	28.883	18.28	626	20	.....	46.8	57.7	50.8	51.892.0	9	31.0	11.0	69.1	42.9	.....	1,061	91.5	21.5	53.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

January.

July.

October.

February.

For 24 days.

Observation missed.

One 4 p. m. observation missed.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Number of calms.	Rainfall or melted snow.		Washington time.										Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.	Northeast.	Southeast.	South.	West.	Northwest.	Total amount.		Any 8 con- secutive hourly measure- ments.	Date.	Cloudiness in tenths.			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.		Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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One 4 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m.: Washington time, correspond with 6.24 a. m., 2.24 p. m., and 10.24 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.830; May, 0.750; June, 0.730; July, 0.770; August, 0.770; September, 0.780; October, 0.800; November, 0.840; December, 0.850. April, 0.820.

**C. F. B. WAPPENHANS,**  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 78.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## INDIANOLA, TEX.

[Latitude, 29° 28' N.; longitude, 96° 21' W. Magnetic variation, 20° 20' E. Elevation of barometer above sea-level, 28 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 40 feet.]

Month.	Barometer (corrected for temperature and instru- mental error only).										Temperature.					Wind.								
	Washington time.			Monthly mean.							Washington time.					Maximum hourly velocity during month.								
	7 p. m.	3 p. m.	11 p. m.	Date.	Lowest.	Highest.	Range.	Self-registering ther- mometers.			Washington time.			Mean maximum.	Mean minimum.	Washington time.			Miles.	Direction from—	Date.			
								Date.	Minimum.	Absolute range.	Date.	11 p. m.	3 p. m.			Monthly mean.	Maximum.	Date.				Minimum.	Absolute range.	7 a. m.
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
Jan.	30.123	30.114	30.163	30.130	30.643	23.28	572.18	771	46.7	62.5	43.8	40.2	74.5	26.18.0	21.56.5	57.2	40.5	3.453	3.704	3.872	11,029	50	N.	8
Feb.	30.164	30.164	30.188	30.173	30.663	27.23	671.23	991	50.6	53.1	53.4	54.0	77.1	12.21.5	5.55.0	60.8	45.4	3.426	3.576	3.540	10,542	60	N.	17
Mar.	30.012	30.010	30.026	30.016	30.451	1.23	581.24	870	61.1	67.4	63.4	64.0	77.8	25.41.3	3.36.5	70.3	57.8	2.916	3.575	3.310	9,801	54	N.E.	7
Apr.	29.894	29.890	29.898	29.894	30.449	1.23	416.21	1,033	67.7	75.6	70.5	71.8	85.7	21.57.1	2.23.6	77.5	65.2	3.866	3.937	3.899	11,722	58	N.W.	28
May	29.936	29.951	29.956	29.948	30.195	6.20	737.29	453	72.9	80.4	75.8	76.2	91.0	30.62.8	21.23.7	82.5	70.8	3.105	3.844	3.889	10,838	49	N.W.	20
June	29.942	29.948	29.942	29.944	30.065	30.23	671.9	304	75.9	87.0	80.3	82.1	94.9	21.69.1	16.28.5	89.5	76.5	2.154	2.751	2.948	7,833	31	S.W.	28
July	30.045	30.045	30.046	30.045	30.237	13.23	809.13	368	79.3	87.6	80.6	82.5	95.1	31.73.7	4.21.4	90.4	77.3	2.057	2.805	3.016	7,908	27	S.	14
Aug.	30.010	30.008	30.008	30.005	30.154	15.33	847.11	307	79.2	90.2	81.4	83.6	96.4	16.72.4	30.23.8	92.4	77.9	1.766	2.190	2.749	6,710	43	N.E.	17
Sept.	30.012	30.002	30.017	30.010	30.195	26.33	860.13	345	75.0	81.8	77.8	78.2	90.0	1.61.2	23.23.8	83.8	73.4	2.876	2.636	2.705	7,707	45	E.	6
Oct.	29.938	29.970	29.966	29.985	30.272	31.23	725.28	547	74.0	80.7	75.8	76.8	89.8	7.51.8	25.33.0	83.1	71.4	3.162	3.538	3.556	10,256	33	N.	18
Nov.	30.097	30.099	30.112	30.093	30.561	16.23	716.10	845	63.1	70.1	65.7	66.3	82.2	5.9.10	42.2	72.8	59.9	3.305	3.534	3.490	10,369	46	N.	26
Dec.	30.116	30.098	30.136	30.113	30.696	15.23	818.18	868	64.2	63.9	55.5	56.5	78.1	6.35.7	16.43.4	63.9	53.9	3.138	3.632	3.536	10,336	36	N.	31
Sums.	300.237	300.231	300.478	300.357	.....	.....	.....	.....	.....	304.7	306.3	281.0	343.7	.....	.....	323.7	707.0	.....	34.884	36,717	40,450	115,061	.....	.....
Means.	30.028	30.021	30.040	30.030	30.696	15.23	416.31	.....	.....	74.6	69.2	70.3	70.6	69.2	77.1	69.9	.....	2.907	3.310	3.571	.....	.....	.....	.....

\* One 7 a. m. observation missed. † December. ‡ April. § August. || January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 8 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.			
										Total amount.	Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.									8 p. m.	11 p. m.	Mean.
1888.																																
Jan.	26	7	16	6	15	8	2	5	2	0.97 to .80	12	12	12	4.8	4.8	4.8	4.8	44.0	44.5	44.5	44.5	87.6	76.4	83.5	16	7	11	2	0	0		
Feb.	26	9	10	17	14	14	13	4	2	0.81 to .30	17	18	18	4.6	4.6	4.6	4.6	47.0	51.5	51.5	51.5	88.2	76.2	83.4	14	14	11	12	2	0		
Mar.	26	9	19	13	24	24	13	2	13	5.32 to .24	18	18	18	5.1	5.1	5.1	5.1	57.9	58.0	58.0	58.0	88.2	74.8	81.5	26	26	19	12	0	0		
Apr.	17	10	11	17	23	1	0	0	0	1.98 to .04	8	8	8	5.4	5.4	5.4	5.4	62.7	63.8	63.8	63.8	84.7	68.8	81.5	4	19	4	0	0	0		
May	7	7	11	31	33	0	0	0	1	3.55 to .02	26	26	26	4.7	4.7	4.7	4.7	67.4	67.8	67.8	67.8	84.7	68.8	81.5	22	19	1	0	0	0		
June	0	1	10	28	43	0	0	0	1	3.75 to .51	4	4	4	3.7	3.7	3.7	3.7	77.4	74.8	74.8	74.8	88.2	68.8	81.5	8	19	1	0	0	0		
July	0	2	7	25	50	4	0	0	4	0.61 to .37	4	4	4	3.0	3.0	3.0	3.0	73.2	73.1	73.1	73.1	88.2	68.8	81.5	10	19	1	0	0	0		
Aug.	6	3	13	18	40	7	1	1	4	0.23 to .20	24	24	24	3.4	3.4	3.4	3.4	74.8	74.5	74.5	74.5	88.2	68.8	81.5	12	12	11	0	0	0		
Sept.	12	9	16	22	17	3	0	0	3	0.84 to .30	4	4	4	2.4	2.4	2.4	2.4	70.5	70.2	70.2	70.2	88.2	68.8	81.5	9	20	11	0	0	0		
Oct.	11	9	16	22	28	0	0	0	3	2.46 to .76	22	22	22	4.8	4.8	4.8	4.8	70.5	70.2	70.2	70.2	88.2	68.8	81.5	6	20	13	0	0	0		
Nov.	17	21	18	15	20	1	0	0	2	1.31 to .53	14	15	15	5.1	5.1	5.1	5.1	58.6	49.3	49.3	49.3	88.2	77.2	86.8	10	12	6	10	0	0		
Dec.	27	8	12	8	21	6	0	0	2	1.77 to .86	11	12	12	4.2	4.2	4.2	4.2	52.0	54.5	54.5	54.5	88.2	73.2	83.5	12	10	6	10	0	0		
Sums	168	95	161	213	242	33	15	29	38	80.60	.....	.....	.....	87.3	62.2	33.4	53.1	753.2	763.7	763.7	763.7	1,044	941.6	987.0	121	185	504	891	4	12	64	
Means	15.48	7.14	7.19	5.31	9.13	0.14	0.42	0.35	.....	.....	.....	.....	.....	4.8	5.2	3.3	4.4	62.9	63.5	63.5	63.5	87.2	70.1	83.1	80.1	183	250	816	227	1.1	13	317.5
	Percentages.								Percentages.								Percentages.															

<sup>1</sup> One 7 a. m. observation missed.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, corresponds with 5.42 a. m., 1.43 p. m., and 9.42 p. m., local time.

Correction for instrumental error of barometer used: From 5.42 a. m., January 1, to 9.42 p. m., December 31, inclusive, —.024 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.080; February, 0.080; March, 0.080; April, 0.080; May, 0.080; June, 0.080; July, 0.080; August, 0.080; September, 0.080; October, 0.080; November, 0.080; December, 0.080.

ISAAC A. REED,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

JACKSONVILLE, FLA.

[Latitude, 30° 20' N.; longitude, 81° 30' W. Magnetic variation, 3° E. Elevation of barometer above sea-level, 48 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.					Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.					Self-registering thermometers.					Washington time.					Miles.	Direction from—	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.	3 p. m.	11 p. m.	In.	V.						Date.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 p. m. to 11 p. m.	3 p. m. to 7 p. m.	11 p. m. to 3 p. m.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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\* January.

† May.

‡ July.

Averages.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.		Washington time.							Number of days—					Remarks.						
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive hours' measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	
									Total amount.	Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.									7 a. m.
1883.																												
Jan.	8	14	0	3	13	11	7	35	4.71 1.35	7.18	5.8	6.1	4.4	4	49.6	52.5	50.8	51.0	87.3	67.6	82.8	79.2	8	13	10	0	0	
Feb.	10	13	2	6	6	15	3	37	4.43 0.35	12.13	4.3	3.0	3.6	4.3	54.7	53.0	53.9	55.9	87.6	60.2	83.6	77.1	11	13	4	0	0	
Mar.	4	12	4	9	13	17	15	8	3.64 2.34	12.13	4.9	2.0	2.7	3.9	47.0	43.7	44.1	47.1	77.2	49.4	80.8	65.5	13	14	4	0	0	
Apr.	5	25	8	11	13	8	6	7	4.48 2.17	23.61	3.6	3.5	3.2	3.9	61.4	58.9	61.5	60.6	83.6	59.8	80.8	74.7	6	20	5	0	0	
May	8	17	11	18	13	10	6	7	3.16 0.92	23.61	3.6	4.7	3.0	3.8	61.9	59.7	62.2	61.3	74.1	50.5	75.8	66.8	12	14	5	0	0	
June	0	3	16	9	14	34	6	4	1.70 3.17	25.26	2.6	3.2	2.9	3.6	72.7	71.7	72.1	72.2	73.9	63.7	84.1	73.9	16	17	8	0	0	
July	0	3	10	16	12	45	2	4	1.68 1.65	25.26	2.6	3.2	2.9	3.6	74.3	72.6	73.8	73.6	73.9	57.1	80.2	72.0	13	17	8	0	0	
Aug.	3	19	7	21	4	19	12	7	1.63 2.59	25.26	2.6	3.2	2.9	3.6	72.6	70.4	72.6	71.9	85.5	58.7	85.1	76.4	11	15	12	0	0	
Sept.	11	25	16	19	7	4	2	9	1.72 2.44	16.17	3.9	3.6	3.3	4.0	67.6	67.4	69.6	68.2	88.3	60.4	85.6	77.6	12	12	7	0	0	
Oct.	18	36	10	3	8	9	1	7	1.72 2.44	16.17	4.3	3.6	3.3	4.5	66.6	66.0	67.7	66.8	88.5	64.9	85.6	79.7	13	12	7	0	0	
Nov.	21	20	8	17	3	2	2	6	0.09 0.09	19.20	4.1	3.4	3.0	4.2	54.8	54.8	54.7	54.0	83.6	60.7	80.7	75.0	14	10	2	0	0	
Dec.	13	15	2	7	13	9	10	9	0.43 0.42	25.26	3.5	3.9	2.3	3.2	50.6	53.2	54.0	52.6	89.2	64.1	86.1	77.8	15	15	1	0	0	
Sums	91	206	94	139	109	182	79	122	53.34	.....	49.8	36.5	34.0	32.0	6731.6	6728.9	6744.6	6735.2	1003.4	4710.7	979.3	897.7	132	172	61	102	0	
Means	Percentages.							Percentages.																	Percentages.			
	3.3	18.8	3.0	12.7	10.0	16.6	6.7	21.1	.....	.....	4.1	5.5	3.4	4.3	61.0	60.7	62.0	61.2	53.6	53.2	81.6	74.3	84.7	116	737.9	0	0.5	14.2

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.42 a. m., 2.42 p. m., and 10.42 p. m., local time.

Correction for instrumental error of barometer used: From 6.42 a. m., January 1, to 10.42 p. m., December 31, 0.000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.060; February, 0.060; March, 0.060; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.060; December, 0.060.

J. W. SMITH,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

KEOKUK, IOWA.

[Latitude, 40° 29' N.; longitude, 91° 20' W. Magnetic variation, 20 E. Elevation of barometer above sea-level, 618 feet. Elevation of exposed thermometer above ground, 47 feet. Elevation of rain-gauge above ground, 60 feet.]

Barometer (corrected for temperature and instrumental error only).														Temperature.				Wind.								
Month.	Washington time.				Monthly mean.				Self-registering thermometers.				Washington time.		Mean maximum.		Mean minimum.		Washington time.				Maximum hourly velocity during month.			
	7 p. m.	3 p. m.	11 p. m.	In.	Lowest.	Date.	Range.	In.	11 p. m.	3 p. m.	7 a. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.	Date.	
1883.																										
Jan.	29.468	29.470	29.492	29.438	30.007	23.28	29.20	1.087	11.2	19.7	15.5	15.5	43.0	30	-13.0	22	56.0	25.5	7.2	2,062	2,597	2,323	7,012	40	NW.	10
Feb.	29.603	29.599	29.599	29.607	29.090	17.28	29.08	1.182	20.2	29.1	25.3	24.9	62.0	16	-7.0	5	69.0	83.6	16.2	1,771	1,964	2,026	5,761	26	SW.	27
Mar.	29.618	29.581	29.603	29.602	29.971	3.28	29.85	1.119	30.0	41.5	34.5	35.3	68.0	14	11.0	7	87.0	44.2	27.2	2,238	2,703	2,687	7,628	30	N.	18
Apr.	29.551	29.511	29.538	29.533	29.627	2.28	29.63	.974	47.8	61.6	62.6	54.0	85.0	13	28.0	1	64.0	64.1	43.7	2,437	2,849	3,007	8,318	38	SE.	21
May	29.270	29.246	29.253	29.258	29.649	11.28	29.80	.860	55.5	66.0	68.0	50.8	84.0	18	38.0	22	46.0	60.1	50.7	2,134	2,653	2,767	7,754	35	E.	18
June	29.282	29.244	29.255	29.267	29.552	1.28	29.93	.576	65.7	73.2	68.2	69.7	91.0	29	52.0	1	38.0	72.0	61.5	1,658	2,215	2,006	5,879	38	E.	16
July	29.357	29.343	29.331	29.344	29.676	18.28	29.13	.742	71.2	82.7	74.1	76.0	96.5	2	56.0	8	88.0	84.4	66.4	1,760	2,112	2,016	5,868	36	S. & E.	18
Aug.	29.427	29.406	29.404	29.412	29.644	6.28	29.14	.503	65.0	73.7	70.0	71.2	90.0	19	55.0	3, 4, 23	94.5	73.8	52.1	1,365	1,802	1,520	4,587	28	S. & E.	20
Sept.	29.423	29.380	29.394	29.399	29.759	9.28	29.09	.172	54.7	72.4	61.0	62.7	86.5	1	88.0	21	52.0	68.5	44.6	1,786	1,971	1,699	4,810	28	NW.	21
Oct.	29.445	29.409	29.420	29.425	29.898	15.28	29.26	1.072	46.7	57.0	50.8	51.5	84.0	8	82.0	2	56.0	53.0	34.1	1,786	2,870	2,308	6,645	28	S.	17
Nov.	29.463	29.407	29.419	29.450	29.985	12.28	29.45	.8	1.140	37.2	49.2	45.1	62.8	8	12.0	15	56.0	52.0	34.1	1,967	1,704	1,511	4,808	26	S. & NW.	20
Dec.	29.426	29.408	29.447	29.437	29.806	14.28	29.22	.964	27.5	36.9	30.9	31.8	62.0	1	2.0	19	60.0	41.6	23.1	1,588	1,704	1,511	4,808	26	SE.	6
Sums.	352,381	352,519	352,662	352,677	.....	.....	.....	.....	352,767.0	0.588	0.506	3	.....	.....	.....	.....	.....	703.6	488.6	.....	23,049	26,918	25,964	74,901	.....	.....
Means.	29.404	29.376	29.386	29.399	29.090	17.28	29.63	.....	44.4	55.8	48.6	49.6	96.5	.....	53	-13.0	123	.....	53.6	40.7	1,357.4	245.2	161.2	.....	.....	.....

\* One 7 a. m. observation missed. † February. ‡ April. § July. || January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—							Rainfall or melted snow.		Washington time.							Number of days—							Remarks.					
	Number of calms.							Total amount.		Any 3 consecutive hours measurements.		Cloudiness (in tenths).			Dew-point (in tenths).			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.								
1883.																													
Jan.	8	8	11	7	9	10	21	21	1 1.24 .45	10.17	4.5	4.3	5.3	5.4	4.8	11.4	10.7	9.0	75.3	70.0	81.2	76.5	8	13	9	11	20	31	0
Feb.	7	8	11	4	7	12	15	20	0 6.13 3.66	15.16	4.8	5.1	5.6	5.2	13.4	18.1	18.1	16.5	74.8	64.1	74.1	71.0	12	4	12	10	10	25	0
Mar.	12	15	9	5	3	13	11	25	0 1.07 .63	24.25	3.7	5.4	5.2	4.8	23.0	26.2	26.2	25.3	74.8	57.1	71.2	67.7	12	10	9	8	1	20	0
Apr.	7	16	9	16	14	11	12	5	2 4.87 1.35	22.23	5.6	5.5	3.8	4.2	38.3	40.7	40.2	38.7	70.9	50.1	64.4	61.8	12	12	6	10	0	3	0
May	17	16	5	11	16	10	13	2	2.97 1.19	26.28	5.9	6.0	3.5	5.1	47.5	47.2	48.4	47.7	75.5	53.2	71.4	66.7	7	18	6	13	0	0	0
June	12	5	8	10	12	9	15	16	3 5.83 1.04	20.21	11.1	3.9	4.3	2.9	3.8	59.2	61.0	59.7	79.4	59.7	78.5	72.5	8	15	7	16	0	0	1
July	9	5	8	11	24	24	4	3	3.15 .85	20.11	3.9	4.5	2.9	3.8	63.2	65.3	65.7	64.7	76.5	57.2	75.7	69.8	12	15	4	13	0	0	7
Aug.	12	11	8	13	12	5	14	7	1.32 .67	21.4	4.4	5.2	2.1	3.9	59.0	59.7	62.4	60.4	81.4	53.7	77.2	70.8	14	12	5	7	0	0	0
Sept.	14	10	19	5	8	9	10	11	1 1.76 1.12	7	3.2	3.5	2.3	3.0	49.0	49.6	50.4	49.7	81.6	46.4	69.4	65.8	17	9	4	8	0	0	0
Oct.	15	17	18	11	8	2	6	14	2 6.95 1.50	17.18	6.1	5.7	6.5	6.1	42.4	42.4	42.8	42.5	85.3	61.7	75.5	74.2	5	15	11	16	0	0	0
Nov.	8	1	3	11	23	15	8	16	5 2.09 1.23	5	3.0	4.3	3.7	3.9	30.4	31.6	32.5	31.5	77.1	52.9	69.3	66.4	11	12	7	4	2	10	0
Dec.	5	5	9	9	8	13	14	17	13 1.20 .65	22.4	4.1	4.4	4.7	4.4	20.8	24.4	22.6	22.6	76.1	62.2	71.8	70.0	13	10	8	7	21	0	0
Sums	126	107	121	108	141	140	134	177	40 38.63	.....	52.7	62.2	49.3	54.8	450.8	476.3	431.7	498.3	978.7	688.3	879.7	832.2	131	145	88	124	40	110	8
Means	Percentages.							Percentages.							Percentages.							Percentages.							
	11.59, 8.11, 10.91, 9.12, 8.12, 21.6, 23.7							4.4, 5.2, 4.1, 4.6, 37.6, 39.7, 40.1, 39.1							77.4, 57.4, 73.3, 69.4, 36.4, 39.8, 24.2, 34.6, 11.0, 30.1, 12.2														

One 7 a. m. observation missed.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 6.02 a. m., 2.02 p. m., and 10.2 p. m., local time.

Correction for instrumental error of barometer used: From 6.02 a. m., January 1, to 10.02 p. m., December 31, inclusive, +0.025 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.690; April, 0.670; May, 0.650; June, 0.640; July, 0.630; August, 0.630; September, 0.630; October, 0.670; November, 0.690; December, 0.710.

FRED. Z. GOSEWISCH,  
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APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

KEY WEST, FLA.

[Latitude, 24° 34' N.; longitude, 81° 49' W. Magnetic variation, 4° E. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 42 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.							
	Washington time.					Monthly mean.					Self-registering thermometers.				Washington time.			Maximum hourly velocity during month.		Date.		
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Date.	Highest.	Date.	Monthly mean.	Date.	Maximum.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	11 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction
1883.	<i>T<sub>a</sub></i>	<i>T<sub>w</sub></i>	<i>T<sub>v</sub></i>			<i>T<sub>w</sub></i>		<i>T<sub>w</sub></i>														
Jan.	30.185	30.099	30.147	30.127	30.348	29.28	851	9	407	70.0	71.0	72.3	82.0	13.27	0	77.2	88.4	2.602	2.708	2.527	7.837	34 NW, N.E.
Feb.	30.136	30.129	30.173	30.134	30.334	29.30	019	23	335	72.8	73.5	73.7	82.4	23.63	0	78.4	71.6	2.669	2.838	2.638	8.763	39 N.E.
Mar.	30.052	30.025	30.039	30.045	30.329	29.42	781	23	548	70.0	70.9	71.5	80.0	31.99	0	78.5	84.0	2.661	2.833	2.633	8.067	33 NW.
Apr.	30.069	30.065	30.019	30.004	30.146	29.28	811	23	397	70.0	70.9	71.5	80.0	30.69	0	85.6	74.5	1.978	2.284	2.229	6.740	44 NW.
May.	30.020	30.001	30.024	30.015	30.154	29.28	747	21	407	70.0	70.9	71.5	80.0	29.70	0	84.6	74.5	1.858	2.284	2.103	6.245	38 SW.
June.	30.038	30.023	30.050	30.037	30.131	29.28	691	8	260	83.3	80.8	83.8	83.8	27.73	2	90.2	77.6	1.216	1.721	1.600	4.597	22 E., S.E.
July.	30.062	30.031	30.106	30.093	30.191	29.30	013	20	178	83.3	80.8	83.8	83.8	29.72	7	91.6	78.9	1.364	1.871	1.809	5.190	24 N.E.
Aug.	30.018	30.001	30.034	30.018	30.142	29.28	876	28	268	83.3	80.8	83.8	83.8	31.20	7	91.2	78.9	1.471	1.871	1.512	4.534	37 SW.
Sept.	29.977	29.947	29.989	29.971	30.190	29.28	802	21	334	81.1	80.0	80.9	80.9	13.71	5	88.7	78.1	1.368	1.604	1.168	4.160	24 N., N.E.
Oct.	29.996	29.952	29.999	29.982	30.124	29.33	791	22	333	78.4	81.9	78.3	79.5	21.20	0	84.4	75.9	1.703	2.072	1.809	5.584	24 N.E., E.
Nov.	30.062	30.015	30.066	30.048	30.187	29.30	801	25	298	73.5	77.6	74.0	75.0	19.67	0	79.0	72.4	2.715	2.906	2.818	8.629	32 N.
Dec.	30.183	30.062	30.140	30.122	30.226	29.28	998	20	224	68.5	74.5	70.8	71.5	19.24	0	76.0	68.3	2.046	2.346	2.214	6.609	33 N.
Sums.	360.601	360.350	360.808	360.616	.....	.....	.....	.....	.....	920.5	983.0	918.3	940.5	.....	1,008.6	887.1	22,733	28,169	25,370	77,272	.....	Averages.
Means.	30.058	30.029	30.067	30.051	30.354	*29.29	747	121	.....	76.7	81.9	76.5	78.4	94.7	912	83.9	73.9	1,977.8	2,347.4	2,114.2	.....	.....

\* February.

† May.

‡ August.

§ January.

Month.	Wind at 7 a. m., 3 and 11 p. m. Direction and Number of times observed blowing from—								Rainfall or melted snow.								Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.				Northeast.				East.				Southeast.				South.				Southwest.				West.				Northwest.				Total amount.		Any 3 consecutive hours measure- ments.		Cloudiness (in tenths).				Dew-point.			Relative humidity (per cent.).			Clear.		Fair.		Cloudy.		.01 inch or more of water.		Maximum below 32°.		Minimum below 32°.		Maximum above 80°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.		3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time. Correction for instrumental error of barometer used: From 6.41 a. m., January 1 to 10.41 p. m., December 31, inclusive, .000 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

A. W. BROWNE  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883*—Continued.

KITTY HAWK, N. C.

[Latitude, 36° N.; longitude, 75° 42' W. Magnetic variation, 2° 45' W. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.						
	Washington time.			Monthly mean.			Self-registering thermometers.			Washington time.			Mean maximum.			Washington time.				Maximum hourly velocity during month.	
	Range.			Range.			Range.			Range.			Range.			Range.				Range.	
	7 a. m.	3 p. m.	11 p. m.	Date.	In.	Lowest.	Date.	In.	Lowest.	Date.	In.	Lowest.	Date.	In.	Lowest.	Date.	In.	Lowest.	Date.	In.	Lowest.
1883.																					
Jan .....	30.193	30.158	30.180	30.179	30.615	24.29	333	91.282	38.4	42.5	40.2	40.4	65.0	28.10.8.	12.45.2	47.2	34.0	0	0	0	0
Feb .....	30.297	30.276	30.293	30.289	30.708	2.29	916	7.792	44.8	50.1	46.1	47.0	76.0	17.32.0.10.	22.44.0	54.8	38.7	0	0	0	0
Mar .....	30.831	29.972	30.013	30.005	30.502	5.29	427	10.1.085	41.5	48.8	42.5	44.3	73.0	30.27.0	22.46.0	53.1	38.3	0	0	0	0
Apr .....	30.032	29.990	30.030	30.017	30.409	4.29	515	23.884	51.2	57.0	51.8	53.3	81.0	6.36.0	8.45.0	61.6	47.0	0	0	0	0
May .....	30.614	29.970	29.990	29.991	30.279	18.29	424	21.853	60.9	67.3	60.9	63.0	86.5	29.47.0	1.39.5	70.4	55.9	0	0	0	0
June .....	30.035	30.006	30.025	30.022	30.333	1.29	748	27.885	72.9	70.9	72.3	75.0	94.0	19.50.0	1.35.0	62.1	68.8	0	0	0	0
July .....	30.092	30.033	30.046	30.047	30.391	21.29	739	24.562	76.8	85.5	75.8	79.4	99.5	23.04.0	20.33.5	80.6	72.1	0	0	0	0
Aug .....	30.039	30.017	30.038	30.031	30.190	5.29	705	29.285	74.2	78.8	73.8	75.6	90.5	20.03.9	8.26.6	80.4	70.5	0	0	0	0
Sept .....	30.061	30.029	30.044	30.045	30.254	27.29	724	24.530	69.8	74.9	70.1	71.8	87.5	14.50.0	8.26.6	80.4	70.5	0	0	0	0
Oct .....	30.126	30.098	30.120	30.115	30.514	17.29	633	29.881	62.5	66.2	62.7	63.8	88.0	2.40.9	25.38.2	61.7	46.9	0	0	0	0
Nov .....	30.222	30.172	30.199	30.193	30.507	16.17	26.883	12.714	50.8	59.0	52.3	54.0	78.2	11.29.0	16.49.2	61.7	46.9	0	0	0	0
Dec .....	30.174	30.129	30.181	30.155	30.511	23.29	652	27.859	44.4	50.7	46.0	47.0	67.5	8.23.0	16.44.5	56.5	40.7	0	0	0	0
Sums ..	361.280	360.830	361.145	361.093	.....	688.2	760.7	694.5	714.4	.....	.....	.....	704.7	698.2	740.4	496.145	603.142	996.1128	495	.....	.....
Means ..	30.107	30.071	30.095	30.091	30.708	12.29	333	99.884	57.4	63.4	57.9	59.5	90.5	22.34.8	12.42.0	61.4	53.2	68.1	54.0	99.1	23.908.7

1 January.

5 July.

1 February.

1 Sum for 11 months.

For 10 days.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—								Remarks.											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fog.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.		Maximum above 32°.										
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.							
Total amount.										Date.		Any 3 consecutive months.																									
In.										In.																											
1883.	Jan.	19	31	4	4	1	14	8	12	0	2.67	25	9	10	6.2	5.8	6.5	34.6	36.0	35.6	86.6	80.8	85.9	84.4	6	14	11	16	1	0	0						
	Feb.	5	31	8	2	5	20	5	8	0	8.16	24	25	9	5.5	6.1	4.9	37.8	39.3	40.3	77.6	68.8	85.9	75.8	9	7	12	10	0	0	0						
	Mar.	11	34	5	2	22	20	6	9	0	6.28	22	19	20	4.6	4.8	4.4	33.5	33.7	34.3	74.0	50.6	73.3	65.8	11	14	6	13	0	0	0						
	Apr.	10	33	3	3	8	19	4	3	0	8.78	24	23	23	5.2	4.7	5.0	47.6	48.0	47.7	47.8	88.1	73.5	86.4	82.7	19	11	10	14	0	0	0					
	May	4	34	3	6	2	33	6	4	0	7.76	14	15	16	4.7	4.6	4.3	35.5	37.4	38.4	56.0	73.5	87.3	81.1	10	15	6	14	0	0	0						
	June	2	16	7	18	3	35	6	3	0	6.57	14	8	8	5.2	4.3	2.9	4.1	68.0	68.5	68.4	85.3	60.8	88.3	81.1	19	18	3	13	0	0	0					
	July	4	21	9	9	7	27	12	4	0	7.23	15	10	10	5.1	4.8	4.4	64.3	65.2	65.4	67.7	80.7	82.0	72.7	70.3	13	16	2	8	0	0	11					
	Aug.	5	41	13	10	4	27	13	0	0	12.39	8	15	16	5.0	6.5	5.8	61.0	64.3	65.2	65.4	67.7	80.7	82.0	72.7	12	10	0	0	0	0	0					
	Sept.	1	38	8	9	3	17	11	3	1	7.73	21	10	11	4.5	3.7	3.0	38.8	42.7	44.4	75.0	62.1	77.1	71.4	15	13	15	0	0	0	0						
	Oct.	6	45	12	9	4	9	3	4	1	3.80	75	5	6	6.0	6.5	5.8	61.0	64.3	65.2	65.4	67.7	80.7	82.0	72.7	11	17	12	15	0	0	0					
	Nov.	10	30	0	2	5	24	6	11	2	2.89	55	25	20	4.2	4.9	4.0	37.6	40.4	38.6	77.8	63.5	76.4	74.6	12	13	6	11	0	0	3						
	Dec.	10	30	3	6	1	21	7	15	0	2.89	58	23	24	4.2	4.9	4.0	37.6	40.4	38.6	77.8	63.5	76.4	74.6	12	13	6	11	0	0	3						
	Sums	87	386	75	84	45	258	79	76	572	86	615	509	953	758	5618	6227	6628	7623	5974	5835	5987	3632	5	114	162	89	141	1	20	16						
	Means																									Percentages.				Percentages.							
		7.9	35.3	6.8	7.4	1.23	6.72	6.9	0.5	.....	5.1	5.0	4.5	4.9	51.3	52.2	52.0	52.0	51.2	60.6	82.3	77.7	31.4	24.4	38.6	9.3	5.5	4.4	.....	.....	.....						

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7:05 a. m., 3:05 p. m., and 11:05 p. m. local time.

Correction for error of barometer used: From 7:05 a. m., January 1, to 11:05 p. m., December 31, inclusive, +.008 inch.

The barometer observations may be reduced to sea level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

WESLEY BLAKE

Private, Signal Corps, U. S. A.



Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—					Remarks.						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calm.	Total amount.	Largest amount.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.								
1883.																													
Jan.....	11	21	7	2	30	12	6	7.9462.54	20	6.9	6.6	5.8	6.4	30.1	32.6	33.1	90.6	69.8	83.8	4	14	13	16	4	16	0			
Feb.....	16	21	7	2	30	18	9	3.461.04	4.5	6.8	6.7	4.8	6.1	36.7	37.1	37.6	85.4	64.6	78.6	9	5	14	15	0	8				
Mar.....	12	16	7	3	20	14	8	8.012.08	30.31	6.0	5.8	4.3	5.4	31.4	29.3	32.3	76.4	45.4	66.4	7	14	10	0	12	0				
Apr.....	11	13	10	4	2	25	11	8.173.75	22.23	4.9	5.9	4.1	5.0	47.0	43.3	46.6	82.9	46.1	73.1	10	12	8	16	0	0				
May.....	10	19	4	3	1	32	8	11.3310.78	15	6.7	4.8	3.9	4.5	51.4	48.8	51.6	81.5	44.9	70.0	65.5	11	15	5	10	0	0			
June.....	10	9	5	1	3	37	7	10.2991.16	6.7	5.2	5.9	3.8	5.0	63.6	62.3	65.1	86.6	54.2	79.5	73.4	6	22	2	11	0	0			
July.....	10	17	4	3	2	31	18	9.3590.87	17	2.8	5.6	3.2	3.9	64.4	61.7	65.4	81.0	50.0	75.5	68.8	10	19	2	13	0	11			
Aug.....	12	31	7	4	0	18	8	3.2481.08	2	3.3	5.5	3.0	3.9	62.8	60.1	63.3	86.3	48.9	73.9	72.1	11	17	8	8	0	0			
Sept.....	7	22	1	3	2	26	7	15.2430.90	23	4.8	5.1	3.4	4.4	54.7	55.7	56.4	92.1	65.3	88.6	82.8	9	10	16	4	7	0			
Oct.....	17	21	4	0	6	23	6	4.4661.43	6	6.3	6.0	4.5	5.6	55.0	57.4	58.4	86.9	51.1	72.6	69.8	15	8	7	1	15	0			
Nov.....	7	35	4	3	2	8	15	10.4182.62	22	4.8	4.7	3.0	4.2	37.0	36.4	37.0	85.8	51.1	72.6	69.8	15	8	7	1	15	0			
Dec.....	6	24	13	4					24	4.9	5.6	3.9	4.8	32.7	33.5	34.2	88.5	61.9	80.9	77.1	10	12	9	12	1	15	0		
Sums..	129	246	68	23	32	286	119	86	103.50.67	.....	61.4	68.2	47.6	59.2	568.8	583.2	581.5	647.8	821.9	865.2	112	164	89	139	6	60	17		
Means..	11.822	7.622	12.926	110.979	9.4	.....	5.1	5.7	4.0	4.9	47.4	46.5	48.5	47.5	85.5	84.0	76.8	72.1	80.7	84.9	38.1	1.6	16.4	4.7	4.7				
	Percentages.								Percentages.								Percentages.												

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.32 a. m., 2.32 p. m., and 10.32 local time. Corrections for instrumental errors of barometer used: From 6.32 a. m., January 1, to 10.32 p. m., June 30, inclusive, — .010 inch; from 6.32 a. m., July 1, to 10.32 p. m., December 31, inclusive, + .023 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.080; February, 1.080; March, 1.060; April, 1.040; May, 1.020; June, 1.010; July, 1.000; August, 1.010; September, 1.020; October, 1.040; November, 1.070; December, 1.080.

JOHN A. CODY,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

LA CROSSE, WIS.

[Latitude, 49° 49' N.; longitude, 91° 19' W. Magnetic variation, 9° E. Elevation of barometer above sea-level, 795 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 67 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Washington time.			Monthly mean.	Higheest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Maximum velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.							Date.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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\* Nine 11 p. m. observations missed.

! February.

: April.

§ July.

|| January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.							
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Date.	Cloudiness in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
									Largest amount.	In.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.								
1883.																															
Jan.....	21	1	0	6	16	12	19	16	2	1.54 .28	30	4.0	4.5	3.9	4.1	4.4	1.0	1.8	1.2	1.7	78.2	72.3	72.9	74.5	31	0	0				
Feb.....	9	1	0	9	21	10	18	16	0	1.25 .55	15	3.8	3.6	4.7	4.0	3.8	10.9	10.2	8.2	8.2	72.6	62.7	63.8	63.1	27	0	0				
Mar.....	18	4	1	4	16	10	13	27	0	1.13 .08	25	5.0	4.6	5.1	5.1	13.8	20.1	17.4	17.1	69.4	61.2	64.9	65.2	11	30	0					
Apr.....	12	13	8	15	11	7	15	1	1	1.49 .83	20	5.8	4.0	4.6	5.1	30.3	32.2	34.1	32.2	63.7	45.7	58.8	53.1	9	0	0					
May.....	18	11	4	5	20	8	13	14	0	3.87 1.00	13	6.2	6.5	4.0	5.6	38.9	37.4	41.4	39.2	67.8	50.8	62.5	60.4	1	0	0					
June.....	14	0	3	5	28	12	11	15	0	3.92 1.41	11	5.1	5.7	3.9	4.9	51.8	53.9	55.6	53.8	68.2	53.1	64.8	62.0	0	0	0					
July.....	14	0	3	5	32	15	12	11	1	11.03 2.60	20	6.1	5.4	4.5	5.3	58.8	60.3	61.4	60.2	75.5	55.7	70.5	67.2	0	0	0					
Aug.....	10	8	3	7	32	16	9	10	4	1.71 .85	11	12.5	4.0	2.8	4.1	53.8	55.2	57.8	55.6	75.2	52.4	70.5	64.0	0	0	0					
Sept.....	22	3	0	7	28	10	3	14	8	4.92 2.00	23	24	4.1	5.0	3.8	4.3	46.0	46.0	49.4	47.1	80.2	55.2	74.7	70.0	0	0	0				
Oct.....	13	5	2	18	18	6	15	14	2	1.68 .58	8	8.9	5.6	7.1	5.8	34.9	35.0	37.8	35.7	73.5	57.2	66.7	67.5	0	0	0					
Nov.....	17	0	0	2	41	7	14	18	0	1.09 .61	25	4.7	5.7	3.2	4.5	25.0	30.2	29.5	28.2	74.5	64.9	72.3	70.6	3	16	0					
Dec.....	17	4	0	6	33	5	14	14	0	1.06 .57	6	7.7	5.2	4.4	4.7	13.5	19.5	17.6	16.9	75.1	71.1	74.7	73.6	15	24	0					
Sums..	175	46	23	84	300	122	148	184	133	69	.....	60.2	64.0	50.0	53.0	365.8	401.7	410.0	392.5	577.1	702.3	683.4	1801.2	112	157	96	118	79	185	3	
Means	16.0	4.2	2.7	7.2	27.4	11.1	13.5	16.8	1.2	.....	.....	5.0	5.3	4.2	4.8	30.5	33.5	34.2	32.7	73.1	53.5	63.7	66.8	30.7	43.0	23.6	33.2	31.6	37.0	0.1	
	Percentages.																									Percentages.					

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.03 a. m., 2.03 p. m., and 10.03 p. m., local time.

Correction for instrumental error of barometer used: From 6.03 a. m., January 1, to 10.03 p. m., December 31, inclusive, —0.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.840; March, 0.820; April, 0.800; May, 0.780; June, 0.760; July, 0.750; August, 0.750; September, 0.770; October, 0.790; November, 0.820; December, 0.830.

S. C. EMERY  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

LEAVENWORTH, KANS.

[Latitude, 39° 19' N.; longitude, 94° 57' W. Magnetic variation, 10° E. Elevation of barometer above sea-level, 842 feet. Elevation of exposed thermometer above ground, 83 feet. Elevation of rain-gauge above ground, 48 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.														
Month.	Washington time.			Washington time.			Self-registering thermometers.				Washington time.																	
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	3 p. m. to 7 a. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Maximum hourly velocity during month.										
1883.																												
Jan.	29.306	29.347	29.287	29.280	29.751	22 28.565	29.121	1866	13.6	24.6	19.9	19.4	50.0	0	10.5	0	20.4	10.5	0	20.4	10.5	1.612	1.844	1.726	5,182	36	NW.	10
Feb.	29.403	29.370	29.385	29.386	29.911	17 28.533	29.151	1778	22.0	23.6	20.5	20.5	50.0	0	15.25	0	30.1	10.6	0	30.1	10.6	1.042	1.325	1.306	3,903	30	NW.	24
Mar.	29.211	29.179	29.200	29.197	29.800	3 58.622	29.151	1772	23.3	24.3	23.4	23.4	50.0	0	17.14	0	40.8	30.9	0	40.8	30.9	1.890	2.363	2.185	6,440	84	N.	16
Apr.	29.003	28.964	28.900	28.986	29.491	24 28.529	29.129	1769	48.0	64.7	50.8	50.8	50.0	0	13.33	0	68.6	45.0	0	68.6	45.0	1.604	2.782	2.670	7,146	36	NW.	14
May	29.056	29.025	29.031	29.037	29.459	11 28.533	29.129	1763	15.0	67.7	70.8	67.7	50.0	0	8.39	0	71.9	50.8	0	71.9	50.8	1.710	2.822	2.534	7,060	30	N.	9
June	29.083	29.041	29.032	29.059	29.260	3 28.703	29.129	1758	11.0	65.4	77.5	70.8	50.0	0	9.20	0	81.0	61.2	0	81.0	61.2	1.236	2.019	1.756	5,001	36	NW.	11
July	29.142	29.113	29.118	29.124	29.445	18 28.535	29.129	1751	12.0	71.1	83.8	77.5	50.0	0	10.31	0	86.5	67.5	0	86.5	67.5	1.207	2.004	1.900	5,467	34	N.	18
Aug.	29.200	29.158	29.180	29.193	29.410	5 28.575	29.129	1745	21.0	80.7	80.7	77.5	50.0	0	11.53	0	82.9	63.0	0	82.9	63.0	635	1,497	1,311	3,413	20	N.	21
Sept.	29.180	29.141	29.179	29.179	29.508	5 28.595	29.129	1738	21.0	72.7	61.7	63.4	49.2	0	11.49	0	74.9	53.0	0	74.9	53.0	603	1,450	1,212	3,335	24	NW.	20
Oct.	29.188	29.141	29.183	29.179	29.608	20 28.459	29.129	1731	47.2	59.3	52.5	53.0	48.5	0	7.8	0	51.0	43.5	0	51.0	43.5	1,243	1,772	1,620	4,045	40	NW.	1
Nov.	29.228	29.172	29.211	29.204	29.813	12 28.546	29.129	1725	54.0	51.2	45.7	44.0	47.0	0	14.15	0	54.8	33.9	0	54.8	33.9	1,287	1,913	1,774	4,971	32	NW.	6
Dec.	29.222	29.192	29.236	29.217	29.885	14 28.535	29.129	1718	55.0	40.8	34.1	35.1	46.0	0	27.01	0	61.0	26.7	0	61.0	26.7	1,405	1,891	1,951	5,310	33	NW.	26
Sums.	350.250	349.766	350.058	350.053					544.9	701.6	613.0	619.9	..				746.9	607.3	15,794	24,087	22,111	61,992						
Means.	29.188	29.140	29.172	29.170	29.911	117 28.329	123		45.4	58.5	51.1	51.7	50.5	53	12.0		62.2	42.3	1,316	2,007	2,184	6,440						5 July.
																												4 April.
																												4 February.
																												One 7 a. m. observation missed.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Any 3 con- secutive 8 hourly measure- ments.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Number of days—					Remarks.										
	North.		Northeast.		East.		Southeast.		South.			Southwest.		West.		Northwest.		Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	7 a. m.	3 p. m.		11 p. m.	Mean.	Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	
	North.	North- east.	East.	Southeast.	South.	South- west.	West.	North- west.																															
1883.																																							
Jan....	16	7	3	6	13	0	3	28	14	75	38	16	4	6	7	4	4	5	2	7	6	14	8	12	6	10	13	8	21	0									
Feb....	15	5	6	15	1	1	3	19	15	2	92	1	5	0	5	7	4	5	0	16	3	22	0	20	7	78	64	72	31	0									
Mar....	25	10	6	12	13	6	1	18	21	1	85	25	4	5	4	4	4	4	8	25	5	36	28	5	26	43	49	65	17	0									
Apr....	12	6	4	14	30	2	4	6	19	6	97	33	14	5	4	7	3	4	4	38	1	35	39	2	37	69	37	55	0	0									
May....	16	6	4	14	30	2	3	17	6	7	33	24	13	5	3	9	4	4	45	6	45	48	3	46	3	73	47	64	0	0									
June....	29	1	2	13	17	4	3	17	7	10	84	41	16	7	4	5	4	5	3	59	3	61	62	6	80	81	58	76	0	0									
July....	14	4	3	13	24	4	1	5	5	3	58	2	15	29	30	3	1	3	63	61	65	4	64	6	67	54	72	13	0	0									
Aug....	21	1	4	15	24	4	2	5	17	1	95	5	7	13	4	4	2	3	61	61	63	7	63	7	85	53	67	0	0										
Sept....	12	7	4	12	12	1	1	12	29	1	57	4	21	22	4	2	3	6	50	3	51	4	51	0	49	70	67	0	0										
Oct....	19	8	18	12	15	0	4	9	8	8	31	1	80	12	6	6	6	6	42	43	44	8	43	7	83	59	76	16	0										
Nov....	11	2	6	4	5	2	1	13	2	65	1	6	3	5	5	2	9	3	30	30	30	7	30	2	74	50	62	3	1										
Dec....	10	2	1	6	5	4	2	24	13	2	02	5	2	6	5	4	4	4	23	23	24	6	24	2	74	52	69	1	0										
Sums..	200	55	63	128	273	38	27	177	134	41	94	.....	53.1	60.7	46.4	53.2	463.3	482.8	492.2	479.5	428.9	643.8	836.0	892.9	136	145	84	118	31	102	18								
Means											Percentages.										Percentages.																		
	18.3	5.0	5.8	11.7	24.9	3.3	5.1	16.2	12.2	.....	.....	.....	4.4	5.1	3.9	4.5	38.6	40.2	41.0	39.9	77.4	53.6	69.7	66.9	37.3	39.7	23.0	32.3	8.5	27.9	94.9								

One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.48 a. m., 1.48 p. m., and 9.48 p. m. local time.

Correction for instrumental error of barometer used: From 3.48 a. m., January 1, to 9.48 p. m., December 31, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .860; February, .860; March, .840; April, .810; May, .860; June, .870; July, .860; August, .860; September, .860; October, .860; November, .860; December, .860.

T. S. OUTRAM  
Corporal, Signal Corps, U. S. A.





Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.	Number of days—	Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Any 8 consecutive hours measure-ments.									Total amount.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.		Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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<sup>1</sup> Inappreciable.

<sup>2</sup> One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time. Corrections for instrumental errors of barometer used: From 4.20 a. m., January 1, to 4.20 a. m., September 30, inclusive, —0.004 inch. From 12.20 p. m., September 30, to 8.20 p. m., December 31, inclusive, +0.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.870; February, 0.870; March, 0.860; April, 0.860; May, 0.840; June, 0.820; July, 0.810; August, 0.810; September, 0.830; October, 0.860; November, 0.870; December, 0.880.

C. E. BUNTJER.

Private, Signal Corps, U. S. A.



### REPORT OF THE CHIEF SIGNAL OFFICER.

543

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—							Rainfall or melted snow, inches.		Washington time.										Number of days—		Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Date.	Cloudiness (in tenths.)			Dew point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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One 11 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.59 a. m., 1.59 p. m., and 9.59 p. m. local time. Correction for instrumental error of barometer used: From 5.59 a. m., January 1, to 9.59 p. m., December 31, inclusive, —.012 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, April, .320; May, .310; June, .310; July, .310; August, .310; September, .310; October, .326; November, .330; December, .330.

W. U. SIMONS,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

LOS ANGELES, CAL.

[Latitude, 34° 8' N.; longitude, 118° 15' W. Magnetic variation, 14° 45' E. Elevation of barometer above sea-level, 371 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 107 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.			Monthly mean.			Range.			Washington time.			Self-registering thermometers.			Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	Date.	Lowest.	In.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.		Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

\* February.

† October.

‡ September.

### REPORT OF THE CHIEF SIGNAL OFFICER.

545

[illegible]

**Inappreciable.**

NOTE.—7 a.m., 3 p.m., and 11 p.m., Washington time, correspond with 4.15 a.m., 12.15 p.m., and 8.15 p.m., local time.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.15 a. m., 2.15 p. m., and 6.15 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.400; February, 0.400; March, 0.400; April, 0.400; May, 0.400; June 0.390; July, 0.390; August, 0.390; September, 0.390; October, 0.400; November, 0.400; December, 0.400.

**T. S. COLLINS,**  
*Sergeant, Signal Corps, U.S.A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

LOUISVILLE, KY.

{Latitude, 36° 19' N.; longitude, 85° 45' W. Magnetic variation, 4° E. Elevation of barometer above sea-level, 530 feet. Elevation of exposed thermometer above ground, 30 feet. Elevation of rain-gauge above ground, 102 feet.}

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.													
	Washington time.					Monthly mean.					Washington time.				Self-registering thermometers.				Washington time.				Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	Date.	Hi-ghest.	Date.	Lowest.	Date.	Range.		7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.	
1883.																												
Jan.	29.580	29.532	29.574	29.562	30.125	22.28	9.64	10	1.171		20.7	37.0	31.8	33.2	56.0	27	7.5	22.48	5	22.48	5	2.073	2.259	2.250	2.250	6.582	31	W.
Feb.	29.609	29.619	29.608	29.612	30.122	18.28	16.1	24	.962		33.7	44.4	40.2	40.1	77.5	16	17.0	100.5	50.1	31.9	31.9	2.120	2.436	2.218	6.774	28	N.	
Mar.	29.606	29.613	29.618	29.612	30.148	3.28	0.31	10	.917		37.3	46.6	40.9	41.6	77.1	18	20.0	2.051	52.3	34.7	34.7	2.080	2.436	2.065	7.581	30	W.	
Apr.	29.394	29.361	29.370	29.376	29.756	3.28	8.86	23	.869		52.0	62.9	56.8	57.2	98.3	14	32.5	156.0	60.3	48.9	48.9	1.680	2.394	2.206	6.589	30	SW.	
May	29.417	29.374	29.383	29.365	29.737	6.28	9.60	26	.747		68.6	70.9	61.9	63.8	87.0	9	37.0	22.50	74.5	54.1	54.1	1.684	2.647	2.477	6.818	32	SW.	
June	29.406	29.370	29.382	29.366	29.713	1.28	0.34	10	.679		69.6	70.8	71.4	72.6	93.0	17	32.0	141.0	83.2	65.6	65.6	1.151	2.180	1.949	5.289	25	SW.	
July	29.403	29.456	29.470	29.473	29.743	18.28	16.4	12	.579		72.1	84.4	74.3	76.9	93.0	4	61.0	28.31	31.3	68.5	68.5	1.234	1.998	1.899	5.131	30	W.	
Aug.	29.506	29.458	29.480	29.481	29.672	6.28	2.81	28	.301		66.1	81.2	71.5	72.9	94.0	22	58.0	6.31	38.0	62.8	64.0	1.090	1.818	1.743	4.660	20	SW.	
Sept.	29.502	29.443	29.470	29.472	29.766	9.28	17.5	24	.501		59.9	77.2	68.6	67.9	92.0	2	44.0	9.48	67.8	58.4	58.4	1.311	2.310	1.912	5.463	20	SW.	
Oct.	29.518	29.502	29.527	29.516	29.673	16.28	9.63	29	.938		53.1	63.4	57.4	58.6	83.9	9	41.0	27.44	67.8	52.7	52.7	1.301	2.279	1.993	6.073	31	W.	
Nov.	29.613	29.594	29.583	29.587	30.124	16.28	16.2	9	.962		45.1	64.4	48.6	49.4	75.0	9	16.3	18.98	57.9	41.5	41.5	1.806	2.247	2.073	6.128	32	N.	
Dec.	29.586	29.524	29.551	29.544	29.867	9.28	0.31	16	.836		37.8	44.5	41.0	41.1	67.5	6	15.0	19.82	50.3	32.8	32.8	1.914	2.302	2.217	6.433	34	W.	
Sums.	354.162	333.698	333.924	333.916	.....	.....	.....	.....	619.9	744.7	682.4	670.3	.....	.....	783.6	579.2	19.492	27.605	25.631	73.221	.....	.....	.....	.....	.....	.....		
Means.	29.513	29.472	29.494	29.493	30.125	+22	28.896	123	.....	51.7	62.3	53.2	56.4	.....	95.0	34	7.5	+22	.....	68.1	48.3	1.905	2.300	472	136.2	.....	.....	

Three observations missed.

January.

April.

July.

Month.	Winds at 7 a. m., 3 and 11 p. m., or Washington time. Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
														7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Mean.									7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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<sup>1</sup> Gauge overhauled; excess unknown.

NOTE.—7 a. m., 3 p. m. and 11 p. m. Washington time, correspond with 6.25 a. m., 2.25 p. m. and 10.25 p. m. local time.

Correction for instrumental error of barometer used: From 6.25 a. m., January 7, to 10.25 p. m., December 31, inclusive, +0.020 inch.

The barometer observations may be assumed to be correct by adding the following corrections for the various months: January, 0.590; February, 0.590; March, 0.590; April, 0.570; May, 0.550; June, 0.550; July, 0.550; August, 0.550; September, 0.550; October, 0.570; November, 0.590; December, 0.600.

L. M. DEY.  
Sergeant, Signal Corps, U. S. A.



**APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.***

**LYNCHBURG, VA.**

[Latitude,  $37^{\circ} 25' N.$ ; longitude,  $79^{\circ} 91' W.$  Magnetic variation,  $0.045^{\circ} W.$  Elevation of barometer above sea-level, 652 feet. Elevation of exposed thermometer above ground, 30 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.	Maximum hourly velocity during month.											
	Washington time.			Monthly mean.			Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.	Mean maximum.			Mean minimum.		Washington time.			Miles.	Direction from—	Date.				
	7 p. m.	3 p. m.	11 p. m.	In.	In.	In.					7 a. m.	3 p. m.	11 p. m.		Monthly mean.	Maximum.		Minimum.	Date.	Δ outside range.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.				3 p. m. to 11 p. m.	Total.		
1883.																													
Jan	29.480	29.435	29.481	29.405	29.847	In.	24	28.860	10	.867	31.4	38.9	33.4	34.9	58.0	7	8.2	134.8	8	41.3	28.6	611	1,012	839	2,462	18	N.W.	11.21	
Feb	29.579	29.536	29.570	29.592	28.998	In.	2	29.135	7	.862	33.7	50.3	43.4	44.5	73.3	17	28.5	274.8	8	52.4	36.7	968	1,280	1,033	3,131	20	N.W.	21.26	
Mar	29.830	29.846	29.807	29.834	28.770	In.	1	28.765	10	1.005	30.4	50.2	40.7	42.0	70.3	19	21.8	224.8	8	52.1	34.6	907	1,568	1,396	3,859	22	N.W.	21.15	
Apr	29.831	29.827	29.818	29.807	28.699	In.	28	28.820	28	.889	42.6	62.2	54.1	55.3	77.8	11	30.8	247.0	9	65.0	45.9	578	1,354	1,041	2,998	18	N.W.	16.20	
May	29.823	29.820	29.826	29.828	28.602	In.	18	28.677	21	.925	62.0	76.2	64.7	67.6	90.2	4	43.8	243.9	9	77.6	50.0	696	1,477	1,323	3,498	23	N.W.	15.15	
June	29.837	29.827	29.823	29.813	28.704	In.	2	28.697	13	.607	72.3	82.6	72.2	75.7	92.6	8	65.0	237.0	8	87.6	63.2	370	1,119	794	2,283	18	N.W.	10	
July	29.890	29.827	29.830	29.859	28.500	In.	21	28.654	24	.496	60.7	86.3	75.2	74.9	96.6	23	58.2	318.4	8	94.9	68.6	325	1,028	726	1,977	18	N.W.	9	
Aug	29.897	29.842	29.896	29.875	28.551	In.	7	28.087	24	.467	68.3	93.2	71.4	74.9	98.6	21	56.0	313.0	8	94.6	64.0	271	1,051	963	2,240	17	N.W.	28	
Sept.	29.410	29.351	29.392	29.381	28.690	In.	10	28.072	24	.688	61.7	74.4	67.2	68.9	88.6	14	41.8	104.0	9	75.4	58.6	523	1,043	964	2,860	13	N.E.	10	
Oct	29.473	29.418	29.469	29.453	28.833	In.	16	28.896	12	.894	54.9	64.1	57.2	58.9	83.0	14	41.8	274.2	8	65.3	52.1	451	970	732	2,108	19	N.W.	31	
Nov	29.519	29.440	29.485	29.481	28.911	In.	17	28.134	14	.757	43.6	56.4	47.2	49.1	75.8	10	19.0	179.8	8	58.4	39.7	381	1,073	731	2,566	24	N.W.	12	
Dec	29.443	29.499	29.452	29.451	28.822	In.	23	28.918	27	.904	56.5	68.2	58.5	61.4	66.0	5	22.5	32.4	5	49.3	32.1	545	1,064	766	2,965	27	N.W.	2	
Sums	353.002	352.920	352.879	353.710	.....	.....	.....	.....	.....	.....	632.874	9,863.9	690.4	.....	.....	.....	.....	704.9	592.0	.....	6,805.14	17,070.11	1,018.31	893	Averages.	.....	.....	.....	
Means	29.417	29.360	29.402	29.393	29.996	.....	.....	28.677	21	.....	52.7	64.6	55.3	57.5	94.6	28	8.2	151.9	.....	66.2	48.5	567.1	1,172.5	918.2	.....	.....	.....	.....	6 January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Any 8 consecutive hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
											Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.52 a. m., 2.52 p. m., and 10.52 p. m., local time.

Correction for instrumental error of barometer used: From 0.32 a. m., January 1, to 10.32 p. m., December 31, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.710; May, 0.680; June, 0.670; July, 0.670; August, 0.670; September, 0.680; October, 0.690; November, 0.720; December, 0.736.

JNO. HEALY.

Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

MACKINAW CITY, MICH.

[Latitude, 45° 47' N.; longitude, 84° 39' W. Magnetic variation, 1° W. Elevation of barometer above sea-level, 605 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 24 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																														
	Washington time.			Monthly mean.			Highest.				Washington time.			Self-registering thermometers.			Mean minimum.			Mean maximum.			Washington time.			Maximum hourly velocity during month.																																																																																																					
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Date.	Range.	Date.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	Date.	Absolute range.	Minimum.	Maximum.	Date.	Mean minimum.	Mean maximum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Date.																																																																																																			
																													Direction from—	Date.																																																																																																	
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.																																																																																																		
Jan	29.376	29.348	29.368	29.364	29.932	428.579	131.353	131.353	13.5	19.1	12.4	16.0	37.0	80.	0	0	22.46	0	22.2	2.771	3.273	3.117	0.161	37	SW.	13																																																																																																					
Feb	29.463	29.471	29.467	29.474	29.961	723.825	161.136	161.136	10.6	19.1	12.4	15.0	43.0	16.	11.0	10.54	0	28.3	2.451	3.042	2.599	8.092	35	SW.	16																																																																																																						
Mar	29.348	29.295	29.339	29.327	29.827	723.464	171.363	171.363	11.6	24.5	16.4	17.5	50.0	15.	0	19.59	0	28.3	1.823	2.745	2.588	7.156	40	SW.	17																																																																																																						
Apr	29.824	29.305	29.318	29.316	29.631	723.621	111.010	111.010	82.9	50.4	34.4	35.9	61.0	15.	3.0	1.58	0	27.1	1.736	2.715	2.493	6.944	40	SE.	13																																																																																																						
May	29.291	29.279	29.289	29.286	29.673	1633.628	131.577	131.577	42.1	50.9	42.1	44.7	79.5	19.	28.0	1.51	0	36.4	2.110	3.171	2.675	7.956	52	E.	10																																																																																																						
June	29.240	29.225	29.277	29.231	29.632	1633.628	131.577	131.577	37.2	63.9	55.4	55.5	80.2	28.	35.7	1.40	0	49.4	1.797	2.541	1.914	6.252	28	W. SW.	14																																																																																																						
July	29.291	29.284	29.277	29.284	29.601	1633.628	131.577	131.577	27.2	67.9	58.9	62.5	83.2	21.	46.8	11.33	0	54.4	1.625	2.372	1.555	6.152	32	S.	1																																																																																																						
Aug	29.392	29.370	29.382	29.381	29.677	1633.628	131.577	131.577	51.8	68.0	53.2	54.7	74.2	19.	34.0	29.40	0	70.3	1.691	2.493	1.945	6.326	36	E.	7																																																																																																						
Sept.	29.428	29.406	29.410	29.415	29.864	1633.628	131.577	131.577	29.1	32.6	42.6	43.4	76.9	19.	24.0	29.40	0	60.9	2.191	2.576	2.618	7.285	28	NW. W.	8																																																																																																						
Oct.	29.466	29.449	29.460	29.458	30.004	1633.628	131.577	131.577	24.0	37.8	35.0	35.5	59.8	5.	8.4	16.51	0	42.2	2.838	3.046	2.611	8.515	40	NW.	12																																																																																																						
Nov	29.306	29.294	29.306	29.302	29.893	2238.770	261.113	261.113	24.0	37.8	35.0	35.5	59.8	5.	8.4	16.51	0	42.2	2.838	3.046	2.611	8.515	40	NW.	12																																																																																																						
Dec	29.324	29.326	29.347	29.313	29.828	2238.789	171.039	171.039	23.5	26.2	24.9	24.9	51.5	7.	8.3	15.48	2	30.7	2.914	3.228	2.999	9.171	41	E.	23																																																																																																						
Sums.	352.269	352.054	352.190	352.171	.....	.....	.....	.....	439.2	522.5	454.0	471.9	.....	.....	.....	.....	.....	562.0	874.0	25.842	33.615	30.109	89.566	.....	.....	.....	.....	.....	.....	.....																																																																																																	
Means.	29.356	29.338	29.349	29.348	30.004	*15.28.464	117.....	.....	36.6	43.5	37.8	39.3	83.2	-11.0	.....	\$10.....	.....	46.8	31.2	153.5	62.801	22.509.1	.....	.....	.....	.....	.....	.....	.....	.....																																																																																																	
* October.																																† March.																																‡ August.																																§ February.																															

\* October.

† March.

‡ August.

§ February.

[illegible]

**Measurements incorrect.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.30 a. m., 2.30 p. m., and 10.30 p. m., local time.

Corrections for instrumental errors of barometer used: From 6.30 a. m., November 4, inclusive, +.010 inch; from 2.30 p. m., November 4, to 10.30 p. m., December 31, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.700; April, 0.680; May, 0.650; June, 0.640; July, 0.640; August, 0.640; September, 0.630; October, 0.670; November, 0.690; December, 0.700.

**D. B. NOTSON,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

MACON, FORT, N. C.

[Latitude, 34° 42' N.; longitude, 76° 40' W. Magnetic variation 20° 30' W. Elevation of barometer above sea-level, 11 feet. Elevation of exposed thermometer above ground, 9 feet. Elevation of rain-gauge above ground, 5 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.				
	Washington time.					Monthly mean.					Self-registering thermometers.					Washington time.				
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	In.	In.	In.	7 a. m.	11 p. m.	Mean.	Maximum.	Date.	Minimum.	Abnormal range.	Mean maximum.	Mean minimum.	Direction from—
1883.																				
Jan.	30.184	30.144	30.179	30.179	30.179	30.172	30.620	23.28	42.5	91.185	41.3	47.2	43.1	43.9	61.0	28.22	0	49.9	58.1	N.E.
Feb.	30.283	30.257	30.288	30.279	30.604	29.28	30.964	25.660	44.2	91.185	47.0	53.9	48.4	48.8	67.0	16.36	0.18	56.8	44.0	N.E.
Mar.	30.039	29.976	30.002	30.006	30.424	29.28	30.964	25.660	44.2	91.185	47.0	53.9	48.4	48.8	67.0	16.36	0.18	56.8	44.0	N.E.
Apr.	30.021	29.976	30.024	30.007	30.401	29.28	30.964	25.660	44.2	91.185	47.0	53.9	48.4	48.8	67.0	16.36	0.18	56.8	44.0	N.E.
May.	30.008	29.960	29.993	29.987	30.252	18.29	30.443	21.809	63.7	72.3	74.2	75.8	75.8	75.8	86.3	21.64	5	74.0	59.9	N.W.
June.	30.028	30.002	30.018	30.016	30.284	18.29	30.443	21.809	63.7	72.3	74.2	75.8	75.8	75.8	86.3	21.64	5	74.0	59.9	N.W.
July.	30.060	30.028	30.053	30.047	30.319	21.809	30.443	21.809	63.7	72.3	74.2	75.8	75.8	75.8	86.3	21.64	5	74.0	59.9	N.W.
Aug.	30.025	29.997	30.026	30.024	30.254	27.29	30.688	11.596	71.0	75.7	77.1	77.1	77.1	77.1	88.0	4.62	0	83.4	71.8	S.W.
Sept.	30.042	30.007	30.024	30.024	30.444	17.20	30.757	2.687	83.3	88.4	83.8	83.8	83.8	83.8	90.1	1.24	0.3	83.4	71.8	S.W.
Oct.	30.117	30.077	30.104	30.099	30.444	17.20	30.757	2.687	83.3	88.4	83.8	83.8	83.8	83.8	90.1	1.24	0.3	83.4	71.8	S.W.
Nov.	30.223	30.172	30.201	30.199	30.617	16.29	30.914	14.703	52.4	56.8	54.6	54.6	54.6	54.6	67.1	11.20	3	62.2	48.8	N.E.
Dec.	30.183	30.135	30.168	30.162	30.462	7.26	30.712	27.750	46.7	53.7	49.5	50.0	50.0	50.0	64.5	5.27	0	55.9	43.0	N.W.
Sums.	361.233	360.732	361.080	361.014	.....	.....	.....	.....	711.4	791.8	725.6	743.0	.....	.....	.....	816.3	669.8	34.347	39.901	113.779
Means.	30.103	30.061	30.090	30.085	30.620	23.28	42.5	9	56.3	66.0	60.5	61.9	61.0	61.0	69.1	122.22	0.12	68.0	55.9	13.284.2

\* January.

† August.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—						Remarks.									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths.)			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.			
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.	
1883.																															
Jan.	17	21	3	8	3	15	6	17	8	8.85	2.59	9, 10	7.1	6.3	5.7	6.4	38.0	40.8	39.5	38.4	88.6	80.4	88.3	85.8	5	13	18	0	6	0	0
Feb.	15	23	2	4	3	25	2	10	0	3.14	.92	24, 25	6.2	6.2	4.0	5.5	43.1	44.1	44.8	44.0	87.7	73.4	87.8	83.0	7	11	10	0	0	0	0
Mar.	12	16	5	1	4	34	5	15	1	5.56	.88	26	4.8	5.6	4.9	5.1	38.4	40.6	41.2	40.4	83.5	66.9	70.9	76.8	10	12	9	0	1	0	0
Apr.	19	18	5	6	9	21	5	7	0	4.42	1.75	23	6.3	7.1	6.7	6.4	51.9	54.6	52.1	52.9	86.6	78.4	90.1	85.0	8	5	17	0	0	0	0
May	12	10	5	2	8	35	4	17	0	6.67	.95	27	5.5	4.7	3.5	4.6	56.2	61.0	59.6	59.6	83.5	68.3	88.7	78.5	12	12	7	0	0	0	0
June	5	11	5	3	17	40	7	2	0	10.89	5.28	2	5.7	6.0	4.5	5.4	70.4	71.7	70.7	70.9	88.2	78.2	88.0	85.4	6	17	7	19	0	0	0
July	4	8	10	11	12	28	15	4	3	6.71	2.39	18	4.9	5.1	3.8	4.6	72.8	73.9	71.9	72.7	83.2	72.4	83.6	79.7	10	15	6	16	0	0	0
Aug.	24	19	3	5	4	19	8	8	3	3.30	.90	16, 17	5.5	5.6	4.6	5.2	70.3	71.6	70.9	70.9	84.1	72.1	86.0	81.4	8	11	12	12	0	0	1
Sept.	11	25	6	8	9	20	6	4	0	112.09	5.80	10, 11	6.2	6.2	3.5	5.3	67.4	68.0	68.0	67.8	88.8	78.4	88.4	83.2	9	11	10	12	0	0	0
Oct.	22	34	3	9	8	7	2	8	0	2.83	.85	12, 13	6.9	5.9	4.4	5.7	60.2	61.0	60.4	60.5	90.1	78.5	89.1	85.9	5	17	9	13	0	0	0
Nov.	20	14	0	4	10	15	6	20	1	5.51	.28	25, 26	4.8	4.6	3.5	4.3	48.2	47.0	48.7	47.3	80.7	65.5	81.3	75.8	12	13	5	9	0	1	0
Dec.	19	15	5	6	7	19	3	16	3	1.86	.61	14	5.1	4.7	3.2	4.3	41.3	43.8	43.8	42.8	82.0	70.6	81.9	78.2	10	15	6	12	0	1	0
Sums	180	214	52	67	94	279	69	128	12	67.45	.....	.....	69.0	68.0	61.3	62.8	688.6	677.6	677.1	689.2	1,033.0	890.1	1,029.0	980.7	102	152	111	158	0	9	1
Means	16.4	19.5	5.4	7.6	10.6	28.2	9.6	16.1	1.1	.....	.....	.....	6.8	6.7	4.8	5.3	54.9	56.5	56.0	55.8	86.1	73.3	85.8	81.7	27.9	41.6	30.4	43.3	0	2.5	0.3
	Percentages.								Percentages.								Percentages.														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7:01 a. m., 3:01 p. m., and 11:01 p. m. local time.

Correction for instrumental error: balance used, 7:01 a. m., January 1, to 11:01 p. m., December 31, inclusive, +0.015.

The barometric observations may be reduced to sea-level by adding the following corrections for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

WILLIAM DALY  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

MAGINNIS, FORT, MONT.

[Latitude, 47° 12' N.; longitude, 109° 10' W. Magnetic variation, 20° E. Elevation of barometer above sea-level, 4,240 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 22 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Washington time.					Maximum velocity month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 a. m.		3 p. m.		11 p. m.	Highest.	Lowest.	Date.	Range.	7 a. m.			3 p. m.			11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.			3 p. m.			11 p. m.			Total.	Miles.	Direction from—	hourly during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	In.	W.	In.	W.	In.					W.	In.	W.	In.	W.	In.	W.									In.	W.	In.	W.	In.	W.	In.	W.	In.					W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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\* September.

† December.

‡ June.

§ February.

Averages.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.	Washington time.							Number of days—					Remarks.											
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.						
										Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.
1888.																																
Jan.	13	4	0	1	0	0	53	22	0	1.30	.40	5.6	7.6	7.9	6.3	7.3	—	2.1	1.6	0	0	0	55.6	55.1	0	29	0					
Feb.	12	1	0	6	0	14	32	19	0	.59	.52	14.12	4.6	6.0	4.3	5.0	—	2.2	4.3	—	0	0	45.9	45.7	0	28	0					
Mar.	0	18	5	4	0	16	31	19	0	1.46	.42	26.21	5.8	6.0	4.3	5.1	—	8.2	17.1	10.0	0	0	45.9	45.1	0	18	0					
Apr.	6	10	1	7	1	23	30	12	0	.39	.23	20.21	4.9	7.1	5.0	5.7	—	17.4	27.1	20.6	0	0	52.3	51.7	0	12	0					
May	1	16	8	22	2	6	26	12	0	1.73	.30	2.65	7.5	6.7	0.9	25.9	34.2	27.0	28.0	22.0	0	52.4	53.8	56.0	0	12	0					
June	0	18	2	15	4	9	21	21	0	.94	.30	10.4	5.3	4.9	4.8	33.7	38.2	46.1	42.4	51.0	0	46.5	46.1	0	0	1	0					
July	0	12	1	6	4	27	26	17	0	.28	.13	5.2	6.4	4.0	5.3	33.8	38.8	41.6	33.4	40.8	0	38.6	38.6	0	0	1	0					
Aug.	4	10	2	21	0	22	19	15	0	.37	.16	21.3	3.0	3.3	3.6	33.3	31.9	38.0	37.3	35.7	0	30.3	34.4	0	6	0	0					
Sept.	11	5	8	15	13	11	14	13	0	.66	.36	12.13	1.5	1.0	1.6	1.4	31.1	35.1	30.6	32.3	58.5	34.5	51.9	49.0	0	4	0	0				
Oct.	5	3	12	14	3	3	19	34	0	4.06	.94	18.19	4.0	4.8	4.2	4.3	22.6	27.6	23.9	24.7	69.0	61.2	69.9	66.7	0	1	0	0				
Nov.	10	15	4	5	0	19	20	17	0	1.12	.18	20.6	5.0	6.3	4.8	5.9	10.9	17.9	11.5	13.4	55.2	51.3	52.0	52.8	0	11	12	8	0			
Dec.	2	9	3	10	0	9	28	32	0	.39	.14	17.6	6.0	5.2	4.2	5.1	7.8	13.8	9.6	10.4	52.0	47.1	50.9	50.0	0	11	10	9	0			
Sums	64	121	46	126	27	159	319	233	0	13.29	.....	57.2	65.1	55.5	59.4	216.8	298.0	240.2	231.7	625.3	550.0	618.0	597.8	124	134	107	107	66	175	1		
Means	Percentages.																			Percentages.												
	5.8	11.1	4.1	21.1	5.2	5.14	5.29	121.3	0	.....	.....	18.1	24.8	20.0	21.0	52.1	45.8	51.6	49.8	34.0	36.7	29.3	31.8	147.9	90.3	3						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.52 a. m., 12.52 p. m., and 8.52 p. m. Correction for instrumental error of barometer used: From 4.52 a. m., January 1, to 8.52 p. m., December 31, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.770; February, 4.750; March, 4.800; April, 4.500; May, 4.410; June, 4.330; July, 4.310; August, 4.310; September, 4.400; October, 4.540; November, 4.600; December, 4.680.

FRANK BURKE,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

MARQUETTE, MICH.

[Latitude, 46° 24' N.; longitude, 87° 24' W. Magnetic variation, 4° 15' W. Elevation of barometer above sea-level, 673 feet. Elevation of exposed thermometer above ground, 36 feet. Elevation of rain-gauge above ground, 57 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Mean maximum.	Mean minimum.	Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 p. m.	3 p. m.	11 p. m.						Monthly means.	Maximum.	Date.	Minimum.	Date.	Absolute range.			11 p. m. to 7 p. m.	7 p. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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\* October.

† July.

‡ March.

§ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.		Northeast.		South.		Southwest.		West.		Northwest.		Number of calm.		Total amount.		Any 3 consecutive hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	South.	North.	South.	North.	South.	North.	South.	North.	South.	North.	South.	North.	South.	North.	South.	North.	South.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.19 a. m., 2.19 p. m., and 10.19 p. m., local time. Correction for instrumental error of barometer used: From 6.19 a. m., January 1, to 10.19 p. m., December 31, inclusive. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.780; March, 0.770; April, 0.750; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.720; October, 0.740; November, 0.770; December, 0.760.

J. GILLIGAN,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

MEMPHIS, TENN.

{Latitude, 35° 9' N.; longitude, 90° 3' W. Magnetic variation, 9° 30' E. Elevation of barometer above sea-level, 221 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 51 feet.}

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.														
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.	Washington time.				Maximum hourly velocity during month.						
	7 a. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	7 a. m.	3 p. m.		11 p. m.	Total.	Miles.	Miles.		Miles.	Direction.	Date.			
1883.																													
Jan.....	29.643	29.817	29.845	In.	29.845	30.412	22	28	456	10	956	35.4	44.0	39.1	39.5	68.0	27	10.0	21	58.0	47.2	31.3	1,208	1,338	3,054	28	SW.	30	
Feb.....	29.659	29.913	29.930	29.930	392	27	29	437	24	955	38.5	48.1	44.8	44.1	79.0	16	21.0	6	58.0	53.1	86.4	1.539	1,655	1,479	3,891	28	NW.	17	
Mar.....	29.753	29.712	29.722	29.729	304	3	28	318	29	938	44.1	53.5	50.0	49.3	74.0	28	29.0	8	29.0	45.0	59.3	42.1	1,608	1,699	4,891	28	NW.	15	
Apr.....	29.638	29.585	29.588	29.600	29.983	3	28	966	22	1,017	57.0	70.4	62.9	63.4	88.0	14	39.0	3	49.0	72.8	54.4	1.359	1,727	1,631	4,717	86	NW.	11	
May.....	29.667	29.640	29.642	29.650	29.934	6	29	346	20	596	62.9	75.1	67.2	68.4	87.0	9	41.0	22	43.0	77.6	58.9	1.416	1,871	1,575	4,862	32	W.	20	
June <sup>1</sup> ...	29.658	29.624	29.628	29.637	29.892	1	29	350	10	542	73.5	85.2	75.7	78.1	95.0	17	57.0	1	38.0	87.6	68.9	689	1,179	1,119	2,967	25	NW.	23	
July.....	29.740	29.710	29.709	29.720	29.982	18	29	450	12	532	75.6	88.2	78.4	80.7	97.0	22	64.0	30	33.0	89.8	71.4	991	1,516	1,804	3,813	48	N.	24	
Aug.....	29.722	29.695	29.706	29.711	29.992	5	29	539	11	343	70.9	84.3	75.3	76.8	94.0	1	61.5	9	32.5	86.2	68.4	921	1,332	1,459	3,712	28	NW.	23	
Sept.....	29.739	29.691	29.707	29.712	29.901	9	29	530	22	374	63.4	78.0	69.3	70.2	92.0	2,15	51.0	22	41.0	79.7	61.1	806	1,361	1,268	3,425	23	NW.	21	
Oct.....	29.735	29.698	29.721	29.718	29.904	15	29	292	29	712	60.9	70.3	64.1	65.1	88.0	7	44.0	26	44.0	72.5	58.2	1,167	1,667	1,535	4,869	29	S.	29	
Nov.....	29.661	29.699	29.698	29.693	29.848	16	29	305	21	966	48.9	60.2	53.3	54.1	77.3	21	20.0	16	57.3	62.7	45.6	1,294	1,711	1,464	4,624	32	NW.	29	
Dec.....	29.827	29.791	29.801	29.806	29.906	15	29	335	26	831	42.2	52.0	46.5	46.9	72.0	1	22.5	19	49.5	57.4	39.6	1,632	1,693	1,513	4,748	41	W.	16	
Sums.....	367,142	365,685	331,356	886	.....	.....	.....	.....	.....	.....	672,810	3,728	6,788	6	.....	.....	.....	.....	.....	.....	845,638	4	14,662	18,569	17,059	50,845	.....	.....	.....
Means.....	29.762	29.724	29.736	29.741	30.412	22	28	966	123	6	54.1	67.5	60.6	61.4	97.0	123	10.0	*21	.....	70.5	53.0	1,221.8	1,547.4	1,431.6	.....	.....	.....	.....	.....

† One 11 a. m. observation missed.

† April.

\* January.

† July.

July.

April.

January.

One 11 a. m. observation missed.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—						Rainfall or melted snow.		Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North. Northeast. Southeast. South. Southwest. West. Northwest.						Total amount.	Largest amount.	Date.	Mean.			7 a. m.			3 p. m.			11 p. m.			Mean.			Clear.	Fair.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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<sup>1</sup>One 11 p. m. observation missed.

<sup>2</sup>Approximated.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.08 a. m., 2.08 p. m., and 10.08 p. m., local time. Correction for instrumental error of barometer used: From 0.08 a. m., January 1, to 10.08 p. m., December 31, inclusive, +0.018 inch. The barometer observations may be reduced to sea-level by adding the following constants for the various months: January, 0.360; February, 0.350; April, 0.340; May, 0.330; June, 0.320; July, 0.310; August, 0.300; September, 0.290; October, 0.280; November, 0.270; December, 0.260.

D. T. FLANNERY  
Corporal, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

MILWAUKEE, WIS.

Latitude, 43° 2' N.; longitude, 87° 54' W. Magnetic variation, 6° E. Elevation of barometer above sea-level, 497 feet. Elevation of exposed thermometer above ground, 105 feet. Elevation of rain-gauge above ground, 135 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.					Monthly mean.					Highest.					Date.					Lowest.						Date.					Range.					Washington time.					Self-registering thermometers.					Washington time.					Mean maximum.					Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 a. m.		3 p. m.		11 p. m.	In.		In.		In.		In.		In.		In.		In.		In.		In.		In.			In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.	

\* One observation on 11 p. m. missed. † April. ‡ July. § January.

\* One 7 a. m. observation missed.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from								Rainfall or melted snow.	Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Number of calms.									Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Total amount.				Date.				Mean.												Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
											Largest amount.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.									7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 6.17 a. m., 2.17 p. m., and 10.17 p. m., local time. Correction for instrumental error of barometer used: From 6.17 a. m., January 1, to 10.17 p. m., December 31, inclusive, +.010 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.800; February, 0.800; March, 0.790; April, 0.770; May, 0.740; June, 0.740; July, 0.730; August, 0.730; September, 0.740; October, 0.760; November, 0.790; December, 0.810.

SAMUEL W. RHODES  
Sergeant, Signal Corps, U. S. A.



[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.16 a. m., 2.16 p. m., and 10.16 p. m., local time. Correction for instrumental error of barometer used: From 6.16 a. m., January 1, to 10.16 p. m., December 31, inclusive,  $-0.019$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.**

**H. U. JONES,**  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

MONTGOMERY, ALA.

[Latitude, 32° 29' N.; longitude, 86° 18' W. Magnetic variation, 5° E. Elevation of barometer above sea-level, 219 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.										
	Washington time.			Monthly mean.			Range.				Washington time.			Self-registering ther- mometers.			Washington time.			Maximum hourly velocity during month.							
	7 p. m.	3 p. m.	11 p. m.	Date.	Highest.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	3 p. m. to 7 a. m.	11 p. m. to 3 p. m.	Total.	Miles.	Direction	Date.		
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
Jan.	29.954	29.914	29.944	29.937	30.471	29.285	29.624	20	.847	44.2	55.5	49.7	49.877	0	20	25.0	12	59.0	58.7	41.9	1.185	1.381	4,017	23	NW.	21	
Feb.	30.041	29.997	30.035	29.930	30.451	27.285	29.751	24	.700	52.6	65.3	54.8	58.251	2	16	32.5	28	48.7	67.4	49.3	1.093	1.451	4,136	18	SE, NW.	2, 17	
Mar.	29.861	29.804	29.827	29.831	30.287	1.28.413	1.28.413	31	.874	47.0	63.4	54.0	54.878	6	30	35.0	3	47.2	65.5	45.1	1,092	1,929	1,621	4,642	32	SE.	25
Apr.	29.788	29.737	29.757	29.761	30.125	3.29.290	3.29.290	22	.835	59.4	74.1	64.1	65.988	0	14	40.8	3	47.2	76.5	56.7	1,738	1,458	1,310	3,506	26	E.	9
May	29.836	29.778	29.797	29.804	29.994	24.29.425	24.29.425	20	.569	63.9	79.8	68.2	70.691	3	15	44.0	23	47.3	82.0	60.5	703	1,525	1,363	3,591	20	NW., SW.	15
June	29.817	29.775	29.787	29.783	29.979	4.39.600	4.39.600	25	.379	74.5	86.1	77.0	79.286	7	20	63.0	2	38.7	89.5	71.9	748	1,357	1,251	3,856	22	W.	21
July	29.863	29.831	29.851	29.855	30.067	22.29.692	22.29.692	12	.395	77.1	90.0	80.2	82.496	6	17	69.2	11	29.4	94.2	74.2	618	1,418	1,311	3,847	22	NW.	23
Aug.	29.834	29.773	29.814	29.807	29.987	14.29.638	14.29.638	29	.829	73.7	89.1	78.2	80.366	3	05.0	31	31.6	91.4	71.8	419	1,129	1,071	2,619	26	NW.	25	
Sept.	29.848	29.773	29.815	29.812	30.048	17.29.614	17.29.614	17	.434	67.7	85.9	74.4	76.896	0	4	53.0	25	43.0	87.2	66.5	516	1,096	930	2,542	17	NW.	1
Oct.	29.866	29.817	29.860	29.854	30.077	19.29.561	19.29.561	29	.513	64.3	79.9	69.4	71.295	0	7	43.3	26	51.7	81.7	62.7	576	1,638	1,820	3,934	23	SW.	17
Nov.	30.006	29.934	29.976	29.972	30.373	16.29.728	16.29.728	23	.645	50.8	60.6	50.4	53.892	3	10	26.0	16	58.3	68.4	49.0	277	1,474	1,136	3,437	20	N.	29
Dec.	29.959	29.920	29.951	29.943	30.241	15.29.668	15.29.668	26	.563	48.1	60.2	52.5	53.672	5	23	26.9	16	45.6	62.6	44.4	743	1,138	906	2,787	22	NW.	12
Suma.	866.713	850.660	856.414	868.393	.....	722.380	0.780	9.900	0	.....	923.1694	0	.....	.....	.....	.....	.....	.....	.....	.....	9,608	17,201	15,060	41,915	.....	.....	.....
Means.	29.893	29.838	29.868	29.866	30.471	29.29.290	29.29.290	122	.....	66.8	74.7	65.1	66.798	6	17	25.0	.....	77.1	57.8	.....	864.81	433.41	254.7	.....	.....	.....	.....

\* January.

† April.

‡ July.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—							Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 80°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
										Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time.

Corrections for instrumental errors of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., June 30, inclusive, +.004 inch; from 6.23 a. m., July 1, to 10.23 p. m., December 31, inclusive, .000.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.240; February, 0.240; March, 0.240; April, 0.230; May, 0.230; June, 0.230; July, 0.230; August, 0.230; September, 0.230; October, 0.230; November, 0.240; December, 0.240.

GEORGE E. FRANKLIN,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

MOOREHEAD, MINN.

[Latitude, 46° 52' N.; longitude, 96° 44' W. Magnetic variation, 13° E. Elevation of barometer above sea-level, 923 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 41 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.											
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.										
	7 a. m.	3 p. m.	11 p. m.	Highest.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Miles.							
																			11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Direction from—	Miles.		
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.					
Jan.....	29.122	29.099	29.120	29.114	29.586	24.28.373	9	1.213	14.8	3.9	10.3	9.7	37.0	9	42.0	20.79.0	1.2	21.2	0	19						
Feb.....	29.195	29.177	29.174	29.182	29.664	23.8.630	10	1.034	4.7	9.8	30.6	2.9	40.0	14.28	33.0	47.3	15.4	9.9	0	16						
Mar.....	29.090	29.098	29.092	29.093	29.633	23.8.283	17	1.350	7.1	20.4	14.8	14.1	44.0	13.17	22.0	7.05	25.0	2.7	16							
Apr.....	29.931	29.907	29.918	29.919	29.440	21.28.418	13	1.022	32.2	46.4	39.3	39.3	74.0	27	6.0	11.68	49.6	29.7	3.083	9						
May.....	29.959	29.936	29.941	29.945	29.204	12.28.182	18	1.112	39.7	56.6	47.9	48.1	72.0	16.22	23.0	11.40	59.9	39.1	2.491	15						
June.....	29.909	29.937	29.930	29.942	29.188	24.28.568	10	1.620	53.1	71.6	60.7	61.8	100.3	30	32.0	13.68	75.6	48.3	2.642	17						
July.....	29.966	29.937	29.901	29.902	29.269	29.28.523	11	1.746	5.2	75.1	63.9	63.9	91.5	11	43.0	18.48	75.1	52.6	1.647	30						
Aug.....	29.025	29.011	29.056	29.062	29.320	5.28.460	21	1.860	54.7	73.2	61.7	63.2	87.0	31	39.0	23.48	75.2	51.2	2.501	26						
Sept.....	29.067	29.056	29.050	29.049	29.435	8.28.744	12	1.691	41.3	64.3	51.5	53.4	87.0	12	17.0	30.70	68.5	42.3	2.686	13						
Oct.....	29.065	29.033	29.050	29.049	29.640	20.28.321	17	1.319	33.5	46.3	40.1	40.0	64.0	7.9	15.0	20.40	48.4	32.4	2.119	7						
Nov.....	29.900	29.954	29.977	29.976	29.647	28.28.397	25	1.250	16.6	31.6	21.5	23.2	55.0	7	14.0	26.69	35.4	11.7	2.240	25						
Dec.*.....	29.069	29.058	29.100	29.076	29.620	31.28.322	17	1.307	0.5	14.1	5.3	6.3	55.0	12	34.0	27.89	0	5.6	2.145	26						
Sums.....	348.394	348.163	348.239	348.265	.....	.....	.....	319.4	505.5	400.5	408.5	.....	.....	.....	.....	548.8	270.3	26.579	33.824	33.662	94.065	.....				
Means	29.033	29.014	29.020	29.022	29.661	*2.28.182	†18	26.6	42.1	33.4	100.3	†30	42.0	†20	.....	45.7	22.5	2.215	0.2	319.0	805.0	.....				
*One 7 a. m. observation missed.																					†May.		‡June.		§January.	
*Incomplete.																					* February		* observation missed.		* One 8 p. m. and one 11 p. m. observation missed.	

\* One 7 a. m. observation missed.

† Incomplete.

‡ One 8 p. m. and one 11 p. m. observation missed.

• February

† May

‡ June

§ January.

## REPORT OF THE CHIEF SIGNAL OFFICER.

567

[illegible]

<sup>1</sup>One 7 a. m. observation missed.

\*One 8 p. m. and one 11 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time.

Correction for instrumental error of barometer used: From 5.41 a. m., January 1, to 9.41 p. m., December 31, inclusive,  $+0.004$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.110; February, 1.100; March, 1.090; April, 1.030; May, 0.980; June, 0.970; July, 0.960; August, 0.970; September, 0.990; October, 1.020; November, 1.060; December, 1.110.

**H. BESSANT,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## MOUNT WASHINGTON, N. H.

[Latitude, 44° 10' N.; longitude, 71° 19' W. Magnetic variation, 13° W. Elevation of barometer above sea-level, 6,379 feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.									
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Washington time.					Maximum hourly velocity during month.				
	7 p. m.		11 p. m.		Range.	Date.	Lowest.	Highest.	Monthly mean.	Range.	7 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m.	7 p. m.	3 p. m.	Total.	Miles.	Direction from—	Date.			
	In.	Out.	In.	Out.																										
1883.																														
Jan.....	23.424	23.409	23.422	23.418	23.363	21	19.22	23.911	0.1	0.838	0.5	1.7	0.1	0.838	21	-23.0	23.67	0	10.3	-9.0	8.043	9.372	10.146	27.561	153	NW.	8			
Feb.....	23.434	23.438	23.453	23.442	23.028	24	22.866	24.222	1.9	1.162	1.9	3.3	1.6	2.843	17	-23.5	27.71	5	13.3	-8.6	9.512	11.298	12.402	126	NW.	27				
Mar.....	23.430	23.233	23.233	23.232	23.653	26	22.709	24.064	0.3	0.935	0.7	3.0	0.3	0.935	27	-24.0	5.02	0	11.7	-10.1	10.485	11.590	12.425	134	NW.	25				
Apr.....	23.558	23.566	23.590	23.572	23.099	14	23.242	23.242	17.5	8.57	17.5	22.7	19.8	20.050	15	-10.0	1.60	0	26.8	12.5	7.505	7.395	8.500	23	SE.	11				
May.....	23.708	23.727	23.715	23.717	23.103	18	23.367	23.367	31.4	7.98	31.4	37.3	33.4	34.061	26	10.8	9.50	5	41.5	39.8	8.500	8.385	8.525	25	SW.	31				
June.....	23.857	23.871	23.861	23.863	23.263	22	23.615	23.615	45.1	4.57	45.1	48.8	45.1	46.665	27	20.8	14.44	6	53.1	40.3	8.940	7.905	7.965	24	NW.	12				
July.....	23.845	23.859	23.852	23.852	23.072	27	23.580	23.580	44.5	4.57	44.5	48.8	45.1	46.665	27	20.8	14.44	6	53.1	40.3	8.940	7.905	7.965	24	NW.	23				
Aug.....	23.863	23.862	23.848	23.848	23.559	24	23.000	23.559	42.1	37.2	42.1	37.2	42.1	38.960	13	14.8	26.45	2	46.0	31.3	8.600	7.550	8.340	124	NW.	9				
Sept.....	23.823	23.866	23.848	23.813	23.117	17	22.934	23.117	28.0	31.8	28.0	31.8	28.0	29.354	10	6.0	15.48	5	35.6	22.4	6.250	6.230	6.445	118	W.	30				
Oct.....	23.607	23.598	23.603	23.603	23.186	25	22.526	23.186	18.3	30.6	18.3	30.6	18.3	19.5	10.568	22	-17.2	29.03	2	11.4	7.455	9.490	9.005	125	NW.	12				
Nov.....	23.456	23.430	23.430	23.429	23.056	6	22.358	23.056	7.6	10.8	7.6	10.8	7.6	9.127	2	-41.0	22.78	2	19.8	-3.0	9.010	10.535	9.440	129	SE.	26				
Dec.....	23.600	23.605	23.605	23.605	23.087	.....	.....	.....	23.2	23.1	23.2	23.1	23.2	23.1	.....	.....	.....	.....	38.6	190.9	97.580	103.579	105.980	307.148	NW.	23				
Sums..	23.638	23.641	23.642	23.640	23.263	.....	.....	.....	23.6	24.363	23.6	23.6	23.6	24.363	.....	.....	.....	.....	32.2	15.9	131.7	131.7	131.7	618.532	.....	.....	.....	.....	.....	.....
Means.	23.638	23.641	23.642	23.640	23.263	.....	.....	.....	23.6	24.363	23.6	23.6	23.6	24.363	.....	.....	.....	.....	32.2	15.9	131.7	131.7	131.7	618.532	.....	.....	.....	.....	.....	.....

\* June.

\* One 8 p. m. observation missed.

\* Insufficient on account of frost work.

\* December.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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<sup>1</sup> One 7 a. m. observation missed.

<sup>2</sup> Two 7 a. m., two 3 p. m., three 11 p. m. observations missed.

<sup>3</sup> One 3 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.23 a. m., 3.23 p. m., and 11.23 p. m., local time.

Correction for instrumental error of barometer used: From 7.23 a. m., January 1, to 11.23 p. m., December 31, inclusive, +0.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.630; February, 6.620; March, 6.620; April, 6.610; May, 6.180; June, 6.120; July, 6.070; August, 6.080; September, 6.150; October, 6.340; November, 6.660; December, 6.680.

EDWARD A. BEALS,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## NASHVILLE, TENN.

{Latitude, 36° 19' N.; longitude, 86° 47' W. Magnetic variation, 20° 30' E. Elevation of barometer above sea-level, 549 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 75 feet.}

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.						
	Washington time.			Monthly mean.			Date.	Lowest.	Highest.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Total.	Maximum hourly velocity during month.		
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.					7 a. m.	3 p. m.	11 p. m.	Mon. bly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.			Mean minimum.	
1883.																							
Jan.	29.591	29.541	29.588	29.573	30.147	22.29	113	20.1034	33.9	43.0	38.2	38.4	63.5	26 11.3	12 52.2	1 53.2	1.532	1.777	1.892	5.201	48	W.	
Feb.	29.702	29.635	29.682	29.680	30.110	27.25	216	24.804	40.4	48.9	44.6	44.6	67.4	16 21.6	18 55.8	1 59.6	1.696	2.008	1.893	5.597	81	SE.	
Mar.	29.485	29.471	29.471	29.468	29.937	3.29	005	31.992	41.1	52.3	46.9	46.9	87.1	18 25.5	20 46.2	2 00.8	1.518	2.001	2.001	5.700	94	W.	
Apr.	29.404	29.371	29.373	29.383	29.703	3.28	803	22.960	54.2	66.6	59.8	60.0	87.5	14 34.7	3 52.8	3 52.8	1.263	1.916	1.778	4.957	40	W.	
May	29.446	29.399	29.419	29.421	29.710	6.28	917	20.763	59.9	73.8	65.1	66.3	85.8	8 42.4	22 43.4	76.5	1.328	2.178	2.045	5.549	41	NW.	
June	29.436	29.390	29.406	29.411	29.668	1.29	127	10.541	71.0	83.0	74.2	76.1	92.4	17 54.9	1 37.5	85.4	931	1.777	1.909	4.317	24	S. W.	
July	29.519	29.484	29.488	29.499	29.746	18.29	202	12.544	71.4	83.3	75.1	76.6	93.6	24 61.1	10 32.5	86.4	775	1.600	1.475	3.850	21	E.	
Aug.	29.502	29.461	29.482	29.482	29.660	5.39	331	28.329	68.1	81.3	72.9	74.1	102.3	19 54.7	31 37.6	83.5	708	1.419	1.235	3.357	30	SW.	
Sept.	29.603	29.446	29.477	29.475	29.665	26.29	255	24.410	61.4	77.8	67.6	68.9	90.2	2 50.6	10 39.6	79.6	886	1.571	1.468	3.929	24	W.	
Oct.	29.613	29.482	29.511	29.502	29.788	18.29	074	29.714	58.9	68.3	61.4	62.9	95.7	11 44.6	26 41.1	70.8	1.301	1.772	1.588	4.751	48	SW.	
Nov.	29.611	29.575	29.604	29.603	30.112	16.29	242	21.870	41.9	57.6	50.1	50.9	75.2	10 16.5	16 58.7	60.8	1.303	1.743	1.662	4.708	90	S.	
Dec.	29.577	29.544	29.564	29.562	29.872	15.29	151	16.721	39.4	49.1	43.0	43.8	87.0	1 20.5	17 49.9	53.3	1.448	1.847	1.640	4.938	97	NW.	
Sums.	354.306	353.765	354.070	354.059					644.6	785.0	698.9	709.6			852.5	610.8	14,767	31,794	20,296	56,647			
Means.	29.526	29.483	29.506	29.503	30.147	22.28	803		53.7	65.4	58.2	59.1	93.6	124 11.3	68.6	50.9	1,260.6	1,816.2	1,600.5				

\* January.

† April.

‡ July.

Month.	Winds at 7 a. m., 8 and 11 p. m.; Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—						Remarks.								
	Number of calms.								Any 3 consecutive 8 hourly measurements.	Total amount.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.	
1883.																															
Jan.	5	9	11	14	14	5	13	24	1	3.73	0.78	7.9	8.0	7.6	7.8	29.7	33.8	31.6	31.7	84.5	72.0	77.8	78.1	4	9	21	19	1	16	0	
Feb.	14	11	14	8	14	2	14	12	1	7.89	2.10	6.7	7.4	6.2	6.8	34.3	37.6	37.1	34.3	79.2	67.9	76.1	74.4	6	9	17	14	1	10	0	
Mar.	10	9	7	8	17	5	18	15	4	3.84	1.41	25	5.9	4.7	5.9	33.7	34.7	35.8	34.7	75.7	54.1	66.4	65.4	9	6	18	9	0	10	0	
Apr.	6	8	14	18	15	8	13	20	4	9.10	5.04	21	6.6	5.1	5.8	47.5	46.6	49.2	47.8	78.5	52.9	66.7	67.0	5	13	12	10	0	0	0	
May	7	9	5	13	16	11	16	10	0	2.79	0.88	26	4.8	5.7	4.8	52.4	52.8	54.2	53.1	77.3	49.3	69.0	65.2	8	15	8	7	0	0	0	
June	7	15	18	11	17	11	19	0	0	4.79	0.77	7	4.8	5.7	4.9	65.7	65.6	67.0	66.1	83.9	56.8	78.5	73.1	4	22	4	14	0	0	0	
July	11	15	12	6	7	17	11	22	0	0.484	1.04	14	5.0	6.5	4.0	67.0	67.1	68.9	67.7	86.2	59.7	81.7	75.9	6	17	8	16	0	0	0	
Aug.	14	15	6	7	10	12	10	22	0	0.439	2.26	12	3.6	5.5	3.0	64.8	63.8	67.1	65.2	89.5	57.1	82.7	76.4	14	14	8	8	0	0	0	
Sept.	14	15	6	7	10	12	10	22	0	0.219	0.86	23	5.1	3.5	4.0	56.9	58.3	59.4	58.2	85.3	52.9	75.7	71.8	10	13	7	8	0	0	0	
Oct.	14	15	6	7	10	12	10	22	0	0.524	1.69	23	7.4	7.3	5.1	6.0	55.5	57.8	56.4	56.6	88.7	71.1	83.7	81.2	7	8	16	13	0	0	0
Nov.	14	15	6	7	10	12	10	22	0	0.807	0.81	23	5.1	5.0	4.4	4.8	40.0	43.9	42.9	42.8	83.2	61.8	76.9	74.0	11	11	8	12	0	0	0
Dec.	13	6	13	14	13	6	13	15	0	0.493	1.60	23	7.7	7.3	6.5	7.2	85.6	87.6	86.7	86.4	66.5	80.0	77.6	3	12	16	13	0	12	0	
Sums	116	111	134	155	135	104	133	198	957.90	.....	70	178.650	5.683	5.583	1599.6006	4598.4	988.4	722.1	918.2	879.6	87	145	133	189	1	57	19	.....	.....		
Percentages.																															
Means																															
10.610.112.214.212.39.512.118.1.8.....73.323.839.736.438.10.315.65.2																															

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 6.21 a. m., 5.21 p. m., and 10.21 p. m., local time.

Correction for instrumental error of barometer used: From 6.21 a. m., January 1, to 10.21 p. m., December 31, inclusive,  $\pm .007$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.610; February, 0.610; March, 0.600;

April, 0.580; May, 0.570; June, 0.560; July, 0.560; August, 0.560; September, 0.570; October, 0.580; November, 0.600; December, 0.610.

L. N. JESUNOFFSKY,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

NEW HAVEN, CONN.

{Latitude, 41° 19' N.; longitude, 72° 56' W. Magnetic variation, 80° W. Elevation of barometer above sea-level, 107 feet. Elevation of exposed thermometer above ground, 112 feet. Elevation of rain-gauge above ground, 106 feet.}

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.							Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Self-registering thermometers.					Washington time.				Mean maximum.				Mean minimum.				Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 a. m.	3 p. m.	11 p. m.							Maximum.	Minimum.	Date.	Absolute range.	Date.	Maximum.	Mean.	Monthly.	Maximum.	Minimum.	Date.	Mean maximum.	Mean minimum.	11 a. m.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

† March.

\* February.

† July.

§ December.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive hourly measurements.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 746 a. m., 3.16 p. m., and 11.16 p. m., local time. Correction for instrumental error of barometer used: From 7.16 a. m., January 1, to 11.16 p. m., December 31, inclusive,  $\pm 0.007$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120; April, 0.120; May, 0.120; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

J. H. SIERMAN,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

NEW LONDON, CONN.

[Latitude, 41° 21' N.; longitude, 72° 5' W. Magnetic variation, 90° W. Elevation of barometer above sea-level, 47 feet. Elevation of exposed thermometer above ground, 29 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.				Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																							
	7 p. m.	3 p. m.	11 p. m.						Mon. by mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			11 p. m. to	7 p. m. to	3 p. m. to	11 p. m. to				Total.																																																																																																																																																																																																																																																																																																																																																																						
1883.	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>w</sub></i>	<i>I&lt;</i>

\* February.

† March.

‡ July.

§ December.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—						Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 consecutive hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity. (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	
										Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.									Mean.
1883.																															
Jan.....	17	21	1	4	3	13	9	81	7	4.88	1.38	20	7.1	6.7	6.5	6.8	17.0	20.4	16.3	17.9	77.0	68.5	66.4	70.6	4	18	14	15	28	0	
Feb.....	10	6	3	8	4	9	22	18	10	6.02	33	15	4.7	4.1	4.3	5.4	21.8	24.9	22.6	23.6	77.9	72.9	70.9	75.9	8	12	18	19	29	0	
Mar.....	17	9	4	14	15	19	15	19	9	3.85	31	20	5.2	4.6	4.9	5.2	24.6	21.3	21.3	22.6	77.5	73.1	68.0	75.9	18	12	9	7	5	29	
Apr.....	16	8	7	16	12	13	9	9	7	3.61	33	12	5.2	5.6	4.9	5.2	24.6	21.3	21.3	22.6	77.5	73.1	68.0	75.9	18	12	9	7	5	29	
May.....	11	13	10	19	13	7	4	4	7	5.73	24	22	4.4	6.0	4.0	4.8	24.3	26.2	23.9	25.3	72.5	67.3	73.2	71.0	7	20	4	13	0	0	
June.....	5	6	4	15	17	23	5	3	12	3.30	26	27	5.5	5.3	4.0	4.8	24.3	26.2	23.9	25.3	72.5	67.3	73.2	71.0	10	15	5	11	0	0	
July.....	9	6	8	11	20	14	14	11	17	7.84	10	26	3.5	4.2	3.8	3.8	62.1	60.2	58.6	62.3	76.1	63.8	70.9	75.0	12	11	4	11	0	0	
Aug.....	9	12	3	8	18	14	11	22	2	2.76	33	18	3.3	3.0	2.6	3.3	57.4	60.5	57.9	58.6	75.4	66.0	70.9	73.8	18	11	11	7	0	0	
Sept.....	10	19	3	6	18	8	10	13	3	3.24	16	24	5.2	5.9	4.3	5.2	51.8	55.7	52.9	53.5	81.3	71.2	81.3	77.3	11	13	8	14	0	0	
Oct.....	22	14	1	4	7	5	9	12	14	7.33	05	23	4.1	5.0	4.3	4.8	42.3	46.3	43.6	43.6	81.3	71.2	81.3	77.3	11	13	8	14	0	0	
Nov.....	11	6	1	4	4	22	14	21	7	3.10	1	26	4.1	5.0	4.3	4.8	38.1	36.1	32.8	35.8	77.7	65.1	78.1	73.6	12	13	5	11	6	12	
Dec.....	23	16	1	3	0	14	17	18	1	3.62	0.60	27	5.5	6.2	4.9	5.5	21.9	27.4	22.7	24.0	76.2	73.9	72.3	74.1	9	11	11	13	6	27	
Sums..	151	122	38	78	100	183	138	157	128	54.87	.....	53	464	351	638	470	5606	5470	5462	6918	5823	7912	9385	0	118	157	90	148	28	131	
Means.	13.81	13.57	1.9	1.9	1.6	7.12	6.14	3.11	7	.....	.....	4.9	5.4	4.3	4.9	39.2	42.2	39.2	40.2	76.5	68.6	70.1	73.7	78.2	34.3	0.94	7.40	5.7	7.35	9	
	Percentages.								Percentages.								Percentages.								Percentages.				Percentages.		

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7.19 a. m., 3.19 p. m., and 11.19 p. m. local time.

Correction for instrumental error of barometer used; from 7.19 a. m., January 1, to 11.19 p. m., December 31, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

JOHN G. LYNGH,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

NEW ORLEANS, LA.

[Latitude, 29° 58' N.; longitude, 90° 4' W. Magnetic variation, 7° E. Elevation of barometer above sea-level, 53 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 84 feet.]

Barometer (corrected for temperature and instrumental error only).														Temperature.					Wind.					
Month.	Washington time.			Monthly mean.				Washington time.			Self-registering thermometers.			Washington time.		Washington time.		Maximum hourly velocity during month.						
	7 a. m.	3 p. m.	11 p. m.	Highest.	Date.	Lowest.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean minimum.	Mean maximum.	Miles.		Direction from—	Date.			
																		7 a. m. to 11 p. m.	11 p. m. to 7 a. m.			7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.
1883.	In.	In.	In.	In.		In.	In.																	
Jan.	30.105	30.065	30.101	30.090	30.629	23.29	826	20.803	53.0	61.3	56.2	56.8	77.0	20.33.5	22.43.5	64.1	49.0	2.056	2.229	1.152	6.437	27	SW.	20
Feb.	30.161	30.134	30.176	30.157	30.622	27.29	831	23.791	59.2	67.8	61.4	62.9	80.0	10.39.5	18.40.5	70.1	55.0	1.625	2.138	1.973	5.736	24	S.	16
Mar.	30.023	29.986	30.006	30.005	30.465	1.29	553	24.012	56.6	67.1	61.4	61.7	80.3	31.44.0	8.36.3	69.4	53.7	1.466	2.071	2.033	5.570	38	E.	24
Apr.	29.912	29.897	29.908	29.909	30.301	16.29	443	22.858	67.9	75.6	70.6	71.4	84.0	24.51.0	9.33.0	77.4	64.7	1.621	2.075	2.046	5.742	26	SE.	21
May.	30.080	29.958	30.070	30.069	30.145	24.29	664	20.431	70.4	79.7	72.9	74.3	88.0	15.68.4	23.31.5	81.2	67.3	1.304	2.248	1.967	5.519	36	NW.	30
June.	29.968	29.947	29.952	29.956	30.085	1.29	762	8.323	78.2	84.6	79.3	80.7	91.8	13.68.4	3.23.4	87.5	74.9	1.858	1.697	1.631	4.186	28	NW.	23
July.	30.050	30.024	30.030	30.035	30.194	23.29	918	12.276	80.3	88.3	81.9	83.5	94.1	13.74.5	1.19.6	90.3	77.0	3.171	1.615	1.520	3.982	27	NW.	26
Aug.	29.981	29.953	29.967	29.967	30.106	15.29	799	11.307	79.7	87.7	82.4	83.3	92.5	6.73.9	17.18.6	89.9	76.8	3.328	1.052	8.905	2.275	27	NW.	22
Sept.	29.983	29.942	29.972	29.968	30.162	27.29	770	22.392	74.9	85.1	78.3	79.4	90.5	7.63.0	25.27.5	86.0	72.5	929	1.628	1.449	4.006	17	NW.	24
Oct.	30.004	29.961	29.995	29.987	30.179	6.29	815	29.364	71.3	80.5	74.5	75.4	88.7	2.49.8	26.38.9	81.5	68.4	1.368	1.946	1.582	4.896	22	NW.	29
Nov.	30.116	30.075	30.109	30.100	30.490	16.29	814	25.676	59.2	68.8	62.5	63.5	81.0	10.36.8	16.44.2	70.5	55.6	1.792	2.263	1.919	5.974	26	NE.	12
Dec.	30.108	30.069	30.101	30.093	30.458	15.29	859	18.599	56.3	65.2	59.4	60.3	76.0	30.37.0	16.39.0	67.4	52.4	1.657	2.040	1.850	5.566	28	N.	15
Sums	360.391	360.011	360.287	360.231	.....	.....	.....	807.0	911.7	841.2	863.2	.....	.....	.....	.....	935.8	767.3	15,851	23,002	21,026	59,879	.....	.....	.....
Means	30.033	30.001	30.024	30.019	30.629	*23.29	443	122	67.2	76.0	70.1	71.1	94.1	118.03.5	*22	77.9	63.9	1,320.9	1,016.8	1,763.2	.....	.....	.....	.....

\* January.

† April.

‡ July.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive hourly measurements.		Total amount.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	
										Largest amount.	Delta.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.									Mean.
1888.																																
Jan.....	10	11	24	12	11	10	1	14	0	10.63	3.71	19	4.8	6.1	4.7	2.2	45.5	47.2	47.2	45.6	76.6	63.0	72.7	71.1	10	9	12	15	0	0	0	
Feb.....	20	16	9	24	11	5	1	2	0	1.59	.88	17	4.6	5.8	4.4	5.6	51.9	52.8	53.1	52.4	78.7	60.4	74.9	71.8	8	10	7	0	0	0	0	
Mar.....	20	11	15	10	10	12	4	11	0	5.01	2.90	24	4.6	8.9	4.4	4.8	48.8	46.5	50.3	48.5	76.4	50.4	68.7	65.2	12	10	9	5	0	0	0	
Apr.....	16	10	14	15	13	11	1	7	2	4.14	2.22	7	5.1	6.8	4.4	6.1	60.2	62.2	61.5	60.9	76.1	61.8	76.1	72.9	8	11	11	0	0	0	0	
May.....	18	5	7	25	25	3	1	4	2	5.41	2.41	26	4.1	6.8	3.8	6.3	61.8	62.0	64.6	63.2	76.2	54.2	76.2	70.9	10	16	5	10	0	0	0	
June.....	8	3	19	12	17	12	15	6	3	12.05	2.68	8	5.4	7.6	4.1	5.7	73.0	72.0	73.2	73.7	84.8	66.6	81.9	77.8	8	19	8	20	0	0	0	
July.....	10	6	6	12	10	20	10	10	3	3.33	1.25	9	3.1	5.8	2.5	3.8	73.6	69.9	73.4	72.3	80.8	55.8	76.8	70.6	13	16	2	10	0	0	0	
Aug.....	11	10	11	10	6	10	7	4	2	4.12	2.09	17	3.1	5.7	2.6	3.6	72.5	68.6	72.8	71.3	79.2	54.8	73.2	66.1	11	18	2	10	0	0	0	
Sept.....	13	10	13	23	8	5	11	3	4	0.25	.23	14	3.9	5.1	2.7	3.9	66.8	64.4	68.5	66.6	76.9	51.4	72.6	67.0	11	17	3	2	0	0	0	
Oct.....	10	19	15	12	18	12	5	6	1	8.43	1.75	17	4.2	4.7	2.5	3.8	66.6	65.2	67.0	66.3	85.5	61.4	78.5	75.1	12	15	4	8	0	0	0	
Nov.....	20	18	15	12	18	0	2	0	5	6.86	2.57	11	3.6	5.7	3.5	4.3	51.0	51.6	52.5	51.7	75.9	57.7	72.5	68.7	10	15	5	9	0	0	0	
Dec.....	25	11	10	18	14	7	2	5	1	3.47	.86	18	5.6	6.6	4.2	5.5	50.4	50.3	51.0	50.6	81.7	61.2	75.5	72.8	9	12	10	12	0	0	0	
Sums ..	176	120	158	185	160	107	66	72	43	60.85	.....	53	67.0	84.8	8.56	2725	2710	2735	2723	7957	1700	7399	6832	5	116	168	81	119	.....	37	.....	
Means ..	16.111	0.14	4.16	9.14	9.8	3.6	64.4	.....	.....	4.5	5.9	3.6	4.7	60.4	59.2	61.3	60.3	73.8	58.4	75.0	71.1	81.8	46.0	232.6	.....	10.1	.....	.....	.....	.....	.....	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 8.08 a. m., 2.08 p. m., and 10.08 p. m., local time.

Correction for instrumental error of barometer used: From 0.08 a. m., January 1, to 10.08 p. m., December 31, inclusive, —0.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.060; February, 0.060; March, 0.060; April, 0.060; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.060; November, 0.060; December, 0.060.

M. HERMAN,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

NEWPORT, R. I.

[Latitude, 41° 29' N.; longitude, 71° 19' W. Magnetic variation, 10° 15' W. Elevation of barometer above sea-level, 44 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 41 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.	Mean maximum.	Mean minimum.	Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.				Maximum.	Minimum.	Date.	Abnor- mal range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
1883.	<i>I<sub>w</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>a</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>a</sub></i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Station closed March 31, 1883.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—								Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Any 8 con- secutive 8 hourly measure- ments.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.		Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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1 Station closed March 31, 1883.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.23 a. m., 3.23 p. m., and 11.23 p. m., local time.

Correction for instrumental error of barometer used: From 7.23 a. m., January 1, to 11.23 p. m., March 31, inclusive, +0.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050.

WM. W. MCGILLIVRAY,

Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## NEW YORK CITY.

[Latitude, 40° 43' N.; longitude, 74° 00' W. Magnetic variation, 7° W. Elevation of barometer above sea-level, 164 feet. Elevation of exposed thermometer above ground, 148 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.									
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Total.	Miles.	Maximum hourly velocity during month.	Date.				
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.					Mean minimum.	7 a. m.	3 p. m.	11 p. m.
1883.																									
Jan.	30.030	29.989	30.021	30.013	30.450	29.401	10	1.049	25.9	30.5	27.0	27.8	45.0	31	3.5	23	42.5	33.5	1.459	1.933	1.753	5,175	36	E.	31
Feb.	30.093	30.064	30.102	30.086	30.617	29.459	7	1.161	29.1	34.5	30.5	31.4	58.0	4	15.0	8	41.0	37.5	1.585	1.913	1.609	5,577	33	W.	13
Mar.	29.833	29.743	29.806	29.794	30.307	29.071	10	1.236	29.6	39.0	33.3	33.6	60.0	18	9.5	8	50.5	42.2	1.937	2.628	2.265	6,820	36	W.	7
Apr.	29.868	29.823	29.858	29.850	30.310	29.473	20	0.837	48.3	51.5	45.0	46.6	70.0	18	26.5	1	43.5	54.8	1.878	1.925	1.897	5,000	36	N.E.	12
May	29.877	29.798	29.809	29.808	30.232	29.352	21	0.880	55.6	65.1	58.6	59.1	81.0	8	41.0	3	40.0	68.6	1.555	1.901	1.618	5,474	31	N.W.	27
June	29.821	29.817	29.828	29.833	30.301	29.433	11	0.868	64.3	74.4	66.8	66.5	87.5	6	53.5	9	34.0	73.6	1.207	1.790	1.644	4,641	27	N.W.	26
July	29.844	29.798	29.823	29.822	30.091	29.564	15	0.527	70.1	78.9	71.0	73.3	90.5	4	58.0	9	32.5	81.4	1.203	1.644	1.678	4,528	32	N.W.	29
Aug.	29.897	29.846	29.892	29.878	30.133	29.477	2	0.659	66.8	77.0	68.7	70.8	87.0	23	59.0	2	38.0	70.1	1.119	1.853	1.531	4,502	45	E.	3
Sept.	29.943	29.894	29.919	29.919	30.292	29.580	24	0.702	59.4	68.9	60.9	63.1	81.0	15	44.5	6	34.5	70.8	1.582	2.026	1.907	5,619	30	N.E.	12
Oct.	30.029	29.967	30.010	30.002	30.481	29.225	29	1.256	50.2	50.0	53.0	53.7	81.0	11	36.0	16	45.0	61.2	1.671	1.895	1.625	5,091	36	N.E.	13
Nov.	29.998	29.951	29.975	29.975	30.449	29.337	11	0.912	41.7	49.1	44.1	45.0	68.0	22	8.0	13	60.0	52.1	1.523	1.798	1.665	5,001	33	W.	16
Dec.	29.891	29.905	29.938	29.932	30.524	29.245	27	1.279	31.2	36.8	33.1	33.7	54.0	8	4.0	23	50.0	40.5	1.699	1.967	1.709	5,875	35	W.	23
Sums..	359.165	358.596	358.970	358.911	.....	.....	.....	.....	570.1	694.7	588.0	607.6	.....	.....	.....	.....	700.3	634.6	617.7	768.23	291.21	62,700	.....	.....	.....
Means.	29.930	29.882	29.915	29.906	30.617	*2	29.071	†10	47.5	55.4	49.0	50.6	90.6	†4	3.5	§23	.....	53.4	43.7	430.7	194.9	1,764.3	.....	.....	.....
																									4 January.
																									1 July.
																									1 March.
																									* February.

\* February.

† March.

‡ July.

§ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Relative humidity (per cent.).						Number of days—						Remarks.		
	Number of calms.								Any 3 consecutive hours measure-ments.		Cloudiness (in tenths).			Dew-point.			7 a. m.			11 p. m.			Mean.	Clear.	Fair.	Cloudy.	Maximum below 32°.	Minimum below 32°.		Maximum above 90°.	
	North	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.									
1883.																															
Jan.	13	23	3	3	5	10	22	7	7	3.22	.90	20.21	7.2	6.8	6.7	6.9	21.4	21.7	20.9	21.3	83.3	70.4	78.3	77.3	3	13	15	20	12	28	0
Feb.	4	9	7	2	7	17	28	6	4	4.58	1.18	10.11	6.0	5.9	4.6	5.5	24.5	27.0	24.9	25.5	83.1	74.2	79.8	79.0	6	13	9	13	4	24	0
Mar.	8	12	7	5	4	16	17	20	4	1.63	.65	30	4.7	4.8	2.8	4.1	22.1	25.9	22.8	23.6	73.7	62.2	68.0	68.6	12	15	8	5	2	24	0
Apr.	7	13	6	9	7	14	11	12	11	3.82	1.03	16.17	6.0	5.6	5.1	5.6	35.1	37.4	35.1	35.9	74.6	63.4	70.8	69.6	7	15	8	12	0	2	0
May	12	11	8	5	16	10	15	8	8	3.03	2.31	21.22	4.2	5.1	4.7	4.7	46.3	47.4	46.3	46.7	73.5	56.3	71.0	69.9	11	12	8	9	0	0	0
June	5	6	8	10	13	22	8	10	4	4.00	1.20	18.19	4.4	5.4	4.7	4.8	60.7	61.0	60.1	60.1	80.4	65.5	80.1	75.3	9	12	8	12	0	0	0
July	7	5	0	2	7	36	15	13	8	3.37	1.05	8	4.7	5.2	3.0	4.0	61.7	60.7	63.7	62.0	75.7	56.0	78.5	70.1	10	16	5	16	0	0	1
Aug.	3	17	6	6	2	21	13	14	11	2.29	1.14	2	4.0	4.6	2.2	3.6	56.1	54.8	57.0	56.0	70.0	49.2	67.3	62.2	16	12	3	6	0	0	0
Sept.	10	15	10	5	12	13	12	5	8	3.57	.98	12.13	5.2	5.6	3.7	4.9	52.5	52.0	53.5	52.7	78.7	57.7	77.7	71.4	9	12	9	13	0	0	0
Oct.	9	20	12	7	11	8	9	6	11	4.71	1.38	23.24	5.3	5.6	3.7	4.9	42.8	42.8	43.0	42.9	76.6	58.1	72.9	69.2	12	9	10	13	0	0	0
Nov.	4	6	1	8	7	21	17	16	10	1.65	.78	26.27	4.8	5.2	3.3	4.4	33.4	34.7	36.0	34.7	73.2	60.0	73.9	69.0	12	11	7	10	0	8	0
Dec.	7	14	0	6	6	17	16	11	3	3.40	.83	23.24	5.6	5.1	5.3	5.3	25.7	25.9	26.2	25.9	80.0	66.4	76.5	74.3	6	16	9	12	4	21	0
Sums	89	151	68	68	97	205	183	131	103	38.83	.....	61.185	2.50	2.59	1.482	3.491	3.489	5.487	8	922.8	739.4	894.8	852.3	113	156	96	141	22	105	1	
Means	8	13.86	2.6	2.8	9.18	7.16	7.11	9.9	4	.....	.....	5.1	5.4	4.2	4.9	40.2	40.9	40.8	40.6	76.9	61.6	74.6	71.0	31.0	42.7	26.3	38.6	6.0	23.8	8.0	3
	Percentages.								Percentages.																						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 1.12 p. m., December 31, inclusive,  $+0.009$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.190; February, 0.190; March, 0.180; April, 0.180; May, 0.180; June, 0.170; July, 0.170; August, 0.170; September, 0.170; October, 0.180; November, 0.180; December, 0.190.

H. J. PENROD,  
Sergeant, Signal Corps, U. S. A.



Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	
											Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								11 p. m.
1883.																														
Jan.	25	21	16	11	2	4	9	12	6	12	6	12	6	12	6	12	6	12	6	12	6	12	6	12	6	12	0			
Feb.	17	16	11	10	6	10	11	15	8	1	15	8	1	15	8	1	15	8	1	15	8	1	15	8	1	15	0			
Mar.	14	18	10	9	17	4	1	1	4	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	0			
Apr.	18	18	9	10	9	17	4	1	4	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	0			
May	13	14	8	6	23	9	6	3	4	6	55	3	4	6	55	3	4	6	55	3	4	6	55	3	4	6	0			
June.	3	8	15	15	7	23	6	3	4	6	55	3	4	6	55	3	4	6	55	3	4	6	55	3	4	6	0			
July	8	17	4	8	15	23	14	2	2	3	87	1	43	15	16	4	6	4	7	2	3	8	0	11	0	4	0			
Aug.	9	82	13	5	12	13	3	5	7	2	91	1	43	15	16	4	6	4	7	2	3	8	0	11	0	4	0			
Sept.	6	28	6	13	18	5	1	1	7	6	53	1	43	15	16	4	6	4	7	2	3	8	0	11	0	4	0			
Oct.	21	31	9	5	8	6	5	3	5	3	79	1	52	22	23	5	1	6	7	5	9	4	0	11	0	4	0			
Nov.	24	11	4	0	13	23	2	8	5	3	53	1	43	15	16	4	6	4	7	2	3	8	0	11	0	4	0			
Dec.	16	12	2	5	8	21	9	6	14	2	40	1	43	15	16	4	6	4	7	2	3	8	0	11	0	4	0			
Sums	174	226	93	72	118	210	84	60	57	54.80	.....	55.5	53.7	49.1	53.1	587.0	601.5	610.7	603.3	142.3	730.7	944.4	872.3	131	153	80	129	0	29	21
Means.	15.920	6.5	6.610	8.19	2.7	5.5	5.2	.....	.....	.....	.....	4.6	5.3	4.1	4.7	49.8	50.1	50.9	50.3	73.5	80.9	78.7	72.7	58.0	42.0	22.0	35.3	0	8.0	5.8
Percentages.																														

One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7.03 a. m., 3.03 p. m., and 11.03 p. m., local time.

Correction for instrumental error of barometer used: From +.06 a. m., January 1, 1883, to 11.03 p. m., December 31, 1883, inclusive, +0.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

WILLIAM DAVIS

Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

NORTH PLATTE, NEBR.

[Latitude, 41° 8' N.; longitude, 100° 45' W. Magnetic variation, 14° E. Elevation of barometer above sea-level, 2,841 feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 84 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.					Monthly mean.	Washington time.					Self-registering thermometers.					Washington time.					Washington time.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.		Lowest.	Date.	Range.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	3 p. m. to 7 a. m.	11 p. m. to 3 p. m.	Total.	Miles.	Direction from—	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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\* One 7 a. m. observation missed.

\* One 7 a. m. observation missed.

\* March.

† April.

‡ July.

§ February.

### REPORT OF THE CHIEF SIGNAL OFFICER.

585

[illegible]

One 7 a. m. observation missed.

Two 7 a. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m.: Washington time, correspond with 5.24 a. m., 1.24 p. m., and 9.24 p. m., local time.

Correction for instrumental error of barometer used: From 5.24 a. m., January 1, to 9.24 p. m., December 31, inclusive, — .010 inch.

The barometric observations may be reduced to sea-level by adding the following constants to the various months: January, 3.120; February, 3.100; March, 3.080; April, 3.060; May, 2.870; June, 2.800; July, 2.800; August, 2.800; September, 2.880; October, 2.960; November, 3.080; December, 3.160.

**JOHN J. McLEAN,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

OLYMPIA, WASH.

[Latitude, 47° 8' N.; longitude, 122° 53' W. Magnetic variation, 22° 0' E. Elevation of barometer above sea-level 36 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 28 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.				Monthly mean.			Highest.			Lowest.			Date.			Range.			Washington time.				Self-registering thermometers.			Mean maximum.			Mean minimum.			Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																														
	7 p. m.	3 p. m.	11 p. m.	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>m</sub></i>

1 For 30 days.

2 One 7 a. m. observation missed.

3 February.

4 December.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Minimum below 32°.	Maximum below 32°.	Maximum above 30°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
											Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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North—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 2.55 a. m. and 7.55 p. m. local time.  
 Correction for instrumental error of barometer used: From 4.25 a. m. January 1, to 7.55 p. m. December 31, inclusive, + .020 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

JNO. DASCOMB,  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

OMAHA, NEBR.

[Latitude, 41° 10' N.; longitude, 95° 50' W. Magnetic variation, 11° E. Elevation of barometer above sea-level, 1,113 feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).						Temperature.				Wind.					
	Washington time.			Monthly mean.			Self-registering thermometers.			Mean minimum.	Mean maximum.	Washington time.			Maximum hourly velocity during month.	Date.
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.			7 a. m.	3 p. m.	11 p. m.	Total.	Direction from—
1883.																
Jan.	28.984	28.949	28.902	28.962	28.883	28.923	28.923	28.923	28.923	28.923	28.923	28.923	28.923	28.923	28.923	28.923
Feb.	29.101	29.078	29.090	29.090	29.011	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052	29.052
Mar.	28.926	28.918	28.936	28.927	28.902	28.912	28.912	28.912	28.912	28.912	28.912	28.912	28.912	28.912	28.912	28.912
Apr.	28.694	28.675	28.702	28.690	28.702	28.696	28.696	28.696	28.696	28.696	28.696	28.696	28.696	28.696	28.696	28.696
May	28.760	28.748	28.737	28.748	28.710	28.729	28.729	28.729	28.729	28.729	28.729	28.729	28.729	28.729	28.729	28.729
June	28.810	28.785	28.778	28.791	28.780	28.785	28.785	28.785	28.785	28.785	28.785	28.785	28.785	28.785	28.785	28.785
July	28.848	28.817	28.831	28.829	28.823	28.827	28.827	28.827	28.827	28.827	28.827	28.827	28.827	28.827	28.827	28.827
Aug.	28.979	28.900	28.897	28.909	28.943	28.922	28.922	28.922	28.922	28.922	28.922	28.922	28.922	28.922	28.922	28.922
Sept.	28.940	28.909	28.928	28.924	28.927	28.924	28.924	28.924	28.924	28.924	28.924	28.924	28.924	28.924	28.924	28.924
Oct.	28.975	28.980	28.926	28.910	28.864	28.892	28.892	28.892	28.892	28.892	28.892	28.892	28.892	28.892	28.892	28.892
Nov.	28.918	28.880	28.891	28.888	28.499	28.807	28.807	28.807	28.807	28.807	28.807	28.807	28.807	28.807	28.807	28.807
Dec.	28.914	28.901	28.924	28.913	28.893	28.903	28.903	28.903	28.903	28.903	28.903	28.903	28.903	28.903	28.903	28.903
Sums.	246,754	246,420	246,627	246,601	246,601	246,601	246,601	246,601	246,601	246,601	246,601	246,601	246,601	246,601	246,601	246,601
Means.	28.896	28.898	28.896	28.898	28.896	28.896	28.896	28.896	28.896	28.896	28.896	28.896	28.896	28.896	28.896	28.896

\* February.

† April.

‡ July.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Number of blows.									Any 3 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Part.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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\* Two 7 a. m. observations missed.

\* One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.45 a. m., 1.45 p. m., and 9.45 p. m., local time.

Correction for instrumental error of barometer used: From 5.45 a. m., January 1, to 9.45 p. m., December 31, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.27; February, 1.27; March, 1.26; April, 1.21; May, 1.16; June, 1.14; July, 1.13; August, 1.14; September, 1.17; October, 1.26; November, 1.24; December, 1.29.

ALEXANDER POLLAK,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## OOGLAAMIE, ALASKA.

[Latitude, 71° 17' N.; longitude, 156° 40' W. Magnetic variation, 86° 22' E. Elevation of barometer above sea-level, 17 feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 12 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.							Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Mean maximum.	Mean minimum.	Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.			Date.	Absolute range.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.		Total.	Miles.	Miles.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

Station closed August 7, 1883.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—													Rainfall or melted snow.		Washington time.				Number of days—					Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	South-southwest.	East-southeast.	South-southeast.	West-northwest.	West-southwest.	Number of calms.	Any 3 con- secutive 8 hourly measure- ments.		Cloudiness (in tenths.)		Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.
															Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.								
1883.																																
Jan.	2	3	9	3	0	3	10	2	9	0	1	17	10	1	2.9	3.3	2.5	2.9	99.3	97.2	99.8	19	10	2	6	31	31	0				
Feb.	4	3	6	5	7	6	14	4	0	4	2	8	10	1	4.3	6.1	5.9	5.4	99.5	99.6	100.0	17	14	7	12	28	28	0				
Mar.	2	5	8	6	6	5	0	1	6	2	16	11	4	3	5.1	4.3	4.2	...	97.8	97.6	100.0	12	16	3	7	31	31	0				
Apr.	10	7	6	1	3	2	12	5	1	5	4	14	4	3	6.4	6.9	6.8	6.7	100.0	99.0	99.8	5	11	14	11	30	30	0				
May	3	9	11	2	3	15	2	13	3	3	9	10	4	1	7.1	7.2	8.1	7.5	99.3	98.6	99.0	3	8	20	5	17	31	0				
June	4	7	12	4	2	4	3	3	9	1	22	7	1	3	8.6	7.3	6.9	7.6	98.7	94.6	94.6	2	10	18	10	2	25	0				
July	4	12	14	1	0	3	2	0	19	0	12	1	6	2	5.5	6.5	7.2	6.4	97.2	94.6	91.5	5	14	12	0	17	0					
Aug.																																
Sept.																																
Oct.																																
Nov.																																
Dec.																																
Sums																																
Means																																

Percentages.

<sup>1</sup> Five 7 a. m., two 3 p. m. observations missed.<sup>2</sup> One 7 a. m., three 3 p. m., one 11 p. m. observations missed.<sup>3</sup> Station closed August 7, 1883.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 1.48 a. m., 9.48 a. m., 5.48 p. m., local time.  
Correction for instrumental error of barometer used: From 1.48 a. m., January 1, to 5.43 p. m., August 6, inclusive, —0.008.

COMPILED AT O. O. S. O.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

OSWEGO, N. Y.

[Latitude, 43° 20' N.; longitude, 76° 38' W. Magnetic variation, 6° 45' W. Elevation of barometer above sea-level, 304 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 63 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.											
	Washington time.					Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.					Washington time.					Maximum hourly velocity during month.			
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.						Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	7 a. m. to 3 p. m.	3 p. m. to 7 p. m.	Total.	Miles.	Direction from—	Date.				
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 7 p. m.	7 p. m. to 11 p. m.	Miles.	Direction from—	Date.		
Jan .....	29.801	29.785	29.793	29.793	29.793	29.803	29.783	4.23.24.43	17.0.998	20.8	25.2	27.9	23.0	42.5	21	-0.8	26	43.8	30.6	14.6	2.890	3.053	2.872	2.872	41	W.	21
Feb .....	29.641	29.646	29.641	29.641	29.641	29.643	29.636	2.23.17.5	7.1.186	24.2	28.9	26.5	26.5	51.3	17	2.0	24	49.3	34.0	18.9	2.896	3.151	2.979	2.979	34	W.	8
Mar .....	29.640	29.587	29.616	29.614	29.613	29.614	29.613	5.23.9.12	10.1.231	32.3	29.2	25.8	26.1	56.0	14	7.5	5	48.5	35.0	17.7	2.490	2.641	2.722	2.722	32	NW.	7
Apr .....	29.681	29.646	29.671	29.668	29.663	29.666	29.659	14.23.23.4	11.0.729	43.9	44.9	41.0	41.4	76.0	15	15.5	1	60.5	50.1	34.7	1.998	2.183	1.671	1.671	25	S.W.	11.27
May .....	29.623	29.601	29.599	29.599	29.599	29.603	29.599	17.23.21.8	20.0.721	63.5	60.7	61.6	60.4	50.1	16	38.5	13	48.0	38.1	34.5	2.745	2.930	2.412	2.412	30	N.E.	11
June .....	29.638	29.599	29.599	29.599	29.599	29.607	29.600	2.23.14.5	11.0.955	83.1	80.7	82.0	80.6	60.0	9	62.0	1	42.2	76.9	57.4	1.914	2.043	1.545	1.545	24	N.E.	11
July .....	29.638	29.609	29.625	29.625	29.625	29.624	29.618	20.23.30.2	13.0.576	85.6	71.9	62.0	61.7	57.5	6	62.0	1	40.0	78.7	60.8	1.914	2.043	1.545	1.545	24	N.E.	11
Aug .....	29.710	29.692	29.704	29.702	29.690	29.702	29.690	27.23.35.9	2.0.431	94.6	61.9	62.0	61.7	57.5	22	62.8	29	45.2	75.5	56.8	1.914	2.043	1.545	1.545	24	N.W.	20
Sept .....	29.771	29.736	29.728	29.728	29.728	29.731	29.719	10.23.36.7	25.1.192	94.6	62.3	64.7	62.3	53.1	10	31.8	21	51.2	43.4	38.7	1.821	2.021	1.405	1.405	24	N.W.	20
Oct .....	29.824	29.793	29.807	29.808	29.803	29.808	29.803	16.23.36.2	29.1.491	94.8	63.8	64.7	62.3	53.1	10	31.8	21	51.2	43.4	38.7	1.821	2.021	1.405	1.405	24	N.W.	20
Nov .....	29.733	29.706	29.738	29.738	29.738	29.740	29.732	28.23.07.0	9.1.123	40.8	44.6	41.4	42.1	70.0	22	19.8	16	50.2	50.1	35.1	2.670	2.713	2.551	2.551	38	NW.	13
Dec .....	29.732	29.707	29.725	29.731	29.725	29.731	29.725	23.23.12.8	27.1.237	38.1	32.4	30.1	30.2	58.0	6	-6.0	23	64.0	37.3	32.0	2.709	2.472	2.710	2.710	33	NW.	26
Sums .....	356.616	356.296	356.444	356.443	356.443	356.443	356.443	516.1596.0	536.5	546.2	.....	.....	.....	.....	.....	.....	.....	641.8	458.5	25.313	29.596	25.670	30.578	.....	.....	.....	
Means .....	29.718	29.691	29.704	29.704	29.704	29.704	29.704	43.0	43.8	44.7	43.5	43.5	44.7	43.5	1.22	-6.0	1.23	53.5	37.8	35.1	100.4	136.3	136.3	.....	.....	.....	

\* October.

† August.

‡ December.

Mon'h.	Winds at 7 a. m. 3 and 11 p. m. Washington time. Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 consecutive hours measure-ments.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
										In.	W.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7:02 a. m., 3:02 p. m., and 11:02 p. m. local time. Corrections for instrumental errors of barometer used. From 7:02 a. m., January 1, to 11:02 p. m., November 30, inclusive, +0.006 inch. From 7:02 a. m., December 1, to 7:02 a. m., December 13, inclusive, +0.021 inch. From 11:02 p. m., December 13, to 11:02 p. m., December 31, inclusive, +0.006 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.350; February, 0.350; March, 0.340; April, 0.346; May, 0.330; June, 0.320; July, 0.320; August, 0.320; September, 0.320; October, 0.320; November, 0.320; December, 0.320.

JULIUS G. LINSLEY  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PALESTINE, TEX.

[Latitude, 31° 48' N.; longitude, 98° 40' W. Magnetic variation, 10° E. Elevation of barometer above sea-level, 533 feet. Elevation of exposed thermometer above ground, 84 feet. Elevation of rain-gauge above ground, 4 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.											
	Washington time.					Self-registering thermometers.					Washington time.					Washington time.					Maximum hourly velocity during month.					Mean maximum.						
	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Range.	Date.	Lowest.	Highest.	Monthly mean.	Date.	Minimum.	Maximum.	Range.	Date.	Mean minimum.	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Date.	Minimum.	Maximum.	Range.	Date.	Mean minimum.	7 a. m.	9 p. m.	11 p. m.	Monthly mean.	Date.	Mean minimum.	
1883.																																
Jan.	28.645	28.608	28.634	28.629	30.172	28.28	312	7.859	37.6	48.8	48.8	48.8	48.8	27.7	7.0	21.68	53.1	33.9	2.275	2.272	2.280	6.777	29	S.	2.275	2.272	2.280	6.777	29	S.		
Feb.	28.703	28.674	28.702	28.689	30.183	28.1	1.108	44.0	52.8	48.5	48.5	48.5	48.5	15.13	5.0	50.4	57.8	39.4	2.167	2.265	2.870	6.901	36	S.	2.167	2.265	2.870	6.901	36	S.		
Mar.	28.547	28.505	28.521	28.535	29.947	8.29	089	80.1	50.9	64.0	58.1	57.7	77.8	28.94	0	20.45	57.8	49.4	2.421	2.777	2.877	7.975	36	N.E.	2.421	2.777	2.877	7.975	36	N.E.		
Apr.	28.406	28.383	28.394	28.398	29.881	10.28	888	28.1	58.8	73.8	65.9	66.0	87.5	12.44	0	1.43	56.8	56.5	2.453	2.793	2.652	7.898	36	S.	2.453	2.793	2.652	7.898	36	S.		
May	28.457	28.452	28.452	28.454	29.715	6.29	213	29.1	66.4	73.9	72.0	72.8	90.0	18.61	5	22.83	53.5	64.0	2.855	2.836	2.540	7.531	32	S.	2.855	2.836	2.540	7.531	32	S.		
June	28.477	28.459	28.441	28.459	29.004	1.39	156	9.448	74.0	85.8	73.6	73.6	93.0	24.64	0	3.81	53.5	71.4	1.857	1.664	1.246	4.267	30	S.	1.857	1.664	1.246	4.267	30	S.		
July	28.564	28.544	28.531	28.546	29.776	18.29	347	14.429	75.2	89.9	79.7	81.6	97.5	37.71	0	11.22	52.9	73.0	1.719	2.153	1.871	5.743	27	N.	1.719	2.153	1.871	5.743	27	N.		
Aug.	28.539	28.506	28.513	28.520	29.636	27.29	349	11.287	73.0	90.6	79.7	81.1	97.0	15.16	0	27.30	52.0	82.0	1.569	1.611	1.534	4.714	21	N.E.	1.569	1.611	1.534	4.714	21	N.E.		
Sept.	28.545	28.507	28.531	28.524	29.679	29.23	337	13.358	63.4	83.7	74.5	74.9	93.5	8.41	0	22.46	56.0	85.0	1.727	1.808	1.725	5.755	25	N.	1.727	1.808	1.725	5.755	25	N.		
Oct.	28.507	28.463	28.496	28.489	29.511	24.23	160	28.1	64.0	78.0	66.1	68.7	94.0	8.41	0	25.53	56.0	81.0	2.020	2.260	2.170	5.550	32	W.	2.020	2.260	2.170	5.550	32	W.		
Nov.	28.609	28.570	28.594	28.593	30.061	16.23	195	21.860	54.0	68.2	59.0	59.7	82.5	9.84	5	16.37	48.0	51.3	2.182	2.504	2.128	6.514	31	N.	2.182	2.504	2.128	6.514	31	N.		
Dec.	28.601	28.590	28.602	28.593	30.118	15.23	218	26.1	48.8	59.6	53.0	53.8	87.0	1.5	23.5	18.46	51.3	45.2	2.309	2.474	2.264	7.047	32	S.W.	2.309	2.474	2.264	7.047	32	S.W.		
Sums.	384,600	354,243	354,401	354,415	.....	718.1	1870.1	1781.9	788.4	.....	.....	.....	.....	.....	.....	908.2	692.3	24,554	27,712	26,106	78,872	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Means.	28.550	28.520	28.531	28.534	30.183	27.23	688.1	22	59.4	72.5	65.2	65.7	97.5	127	7.0	75.7	56.9	2,016.2	2,306.8	2,176.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

Five 7 a. m., six 8 p. m., and six 11 p. m. observations missed. By dial. February. April. July. § January.

Month.	Winds at 7 a.m. 3 and 11 p.m. Washington time: Number of times observed blowing from—								Number of calms.	Rainfall or melted snow.			Washington time.												Number of days—						Remarks.
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.		Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew point.			Relative humidity (per cent.).			Clear.	Partly.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.					
											7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.								3 p.m.	11 p.m.	Mean.		
1883.																															
Jan.	26	19	3	21	14	21	14	1	3.79	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20	1.07	19.20
Feb.	22	19	6	21	14	21	14	0	4.01	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16	1.09	19.16
Mar.	12	19	6	23	12	23	12	0	5.32	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24
Apr.	12	14	6	23	12	23	12	0	5.32	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24	2.37	21.24
May	12	9	10	48	2	0	4	2	6.82	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24	1.50	21.24
June.	1	3	3	38	0	7	16	1	2.83	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28	1.68	28.28
July.	1	1	4	43	10	3	1	0	1.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28	0.93	28.28
Aug.	24	23	5	24	17	3	3	0	0.30	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28	0.23	28.28
Sept.	18	24	10	6	24	6	3	0	1.97	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4	1.23	15.4
Oct.	8	15	10	5	28	4	3	0	1.40	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19	1.81	18.19
Nov.	12	20	8	30	0	0	0	0	2.50	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11	5.20	10.11
Dec.	19	16	8	28	0	17	0	0	2.50	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6	1.88	9.6
Sums	186	182	72	80	249	88	23	91	29	43.49	.....	69.17	70.843	61.3	644.6	641.0	655.6	647.1	685.4	656.5	649.2	630.2	108	162	89	108	4	23	78	.....	
Percentages.																															
Means 15.4 16.9 6.7 7.432 8.0 2.1 8.4 2.7 69.2 30.1 45.1 24.8 30.1 1.1 6.1 21.7																															

Five 7 a. m., six 3 p. m., and six 11 p. m. observations missed.

**NOTE.**—7 a. m., 3 p. m., and 11 p. m., Washington time, corresponds with 5.45 a. m., 1.45 p. m., and 9.45 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.580; February, 0.580; March, 0.570; April, 0.560; May, 0.550; June, 0.540; July, 0.540; August, 0.540; September, 0.550; October, 0.560; November, 0.570; December, 0.580.

**P. T. JENKINS,**  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PENSACOLA, FLA.

[Latitude, 30° 29' N.; longitude, 87° 13' W. Magnetic variation, 5° 45' E. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 33 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.								
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Miles.	Maximum hourly velocity during month.	Direction from—	Date.
	7 a. m.	3 p. m.	11 p. m.	7 a. m.							3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.			Date.	Absolute range.					
1883.	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Jan.....	30.156	30.119	30.140	30.141	30.674	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840	23.29.840
Feb.....	30.228	30.194	30.234	30.219	30.623	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957	28.29.957
Mar.....	30.066	30.030	30.047	30.048	30.509	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638	1.30.638
Apr.....	30.078	30.032	30.068	30.060	30.294	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570	3.28.570
May.....	30.027	30.000	30.016	30.014	30.206	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820
June.....	30.010	30.000	30.016	30.000	30.000	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820	2.43.820
July.....	30.084	30.053	30.061	30.060	30.258	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922	22.23.922
Aug.....	30.019	30.019	30.019	30.019	30.139	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853	15.23.853
Sept.....	30.020	30.020	30.020	30.020	30.198	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818	27.23.818
Oct.....	30.057	30.004	30.042	30.034	30.212	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838	0.20.838
Nov.....	30.171	30.120	30.150	30.150	30.500	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923	16.23.923
Dec.....	30.154	30.110	30.150	30.138	30.433	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925	15.23.925
Sums	360.970	360.518	360.833	360.774	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means	30.081	30.043	30.069	30.064	30.674	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570	23.29.570

• January.

† April.

‡ July.

§ December.

§ December.

† July.

† April.

• January.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.							
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Largest amount.	Date.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
									7 a. m.	3 p. m.			11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										
1883.									<i>In.</i>	<i>In.</i>																						
Jan.....	21	18	14	6	10	7	1	6	10	9.97	3.08	17.18	4.9	3.4	4.3	4.9	44.8	47.0	47.4	46.4	82.3	69.8	70.9	77.3	8	18	5	15	0	1	0	
Feb.....	25	10	9	23	3	5	0	1	8	12.1	1.10	24.25	5.3	6.7	3.2	5.1	51.9	33.3	55.2	54.1	85.9	72.8	85.6	81.4	10	10	8	9	0	0	0	
Mar.....	13	5	10	18	17	5	9	1	3	20.1	0.1	7.6	3.7	4.5	4.1	4.8	43.1	46.6	60.9	61.5	78.9	56.0	78.3	71.1	13	12	6	6	0	0	0	
Apr.....	16	3	7	15	22	15	5	7	0	7.3	2.17	30	4.6	3.4	2.2	4.1	61.2	72.4	62.2	74.0	79.1	60.6	76.3	72.0	11	11	8	13	0	0	0	
May.....	10	4	4	13	35	9	4	14	0	7.47	3.82	30	4.6	3.4	2.2	4.1	61.2	72.4	62.2	74.0	73.0	60.6	76.3	72.0	10	16	5	6	0	0	1	
June.....	5	3	5	17	21	29	5	3	0	9.36	2.67	10.11	4.8	5.9	4.2	5.0	73.2	74.0	73.5	73.5	83.2	65.6	79.1	76.0	9	14	7	16	0	0	4	
July.....	7	7	3	9	20	37	11	3	0	3.29	0.79	3.4	2.6	3.3	1.4	2.6	73.6	74.0	72.8	72.8	85.8	65.0	80.1	76.0	18	13	0	11	0	0	16	
Aug.....	7	7	8	10	28	14	7	9	3	3	73.2	16	28	4.2	3.3	3.2	72.5	73.0	72.5	72.5	85.8	65.0	80.1	76.0	11	17	3	11	0	0	16	
Sept.....	13	14	10	11	21	16	3	9	3	0.82	0.23	23	4.6	4.0	2.2	3.1	62.6	67.3	67.6	66.5	79.3	58.7	76.1	71.4	12	15	3	5	0	0	3	
Oct.....	16	13	15	15	16	17	2	8	1	1.01	0.91	25	3.2	3.9	2.2	3.1	62.6	67.3	67.6	66.5	79.3	58.7	76.1	71.4	18	9	4	3	0	0	0	
Nov.....	23	23	11	13	12	2	0	0	0	3.61	1.74	25.28	5.3	4.2	3.7	4.4	46.9	48.3	48.3	48.2	74.0	56.5	71.2	67.2	10	12	8	7	0	0	0	
Dec.....	23	19	14	9	7	5	4	3	9	5.30	1.75	7.8	5.3	5.3	5.6	4.1	5.0	47.4	51.3	49.2	49.3	81.7	67.0	78.9	73.9	9	13	9	9	0	1	0
Sums ..	187	130	105	141	213	163	47	74	35	61.55	.....	56	59	37.7	51.1704	4.728	3.725	6.718	7.988	0.776	6.950	4.905	0	139	100	66	111	0	2	40		
Means ..	17.1	11.9	9.6	12.9	19.5	14.9	5.6	8.3	2	4.7	4.9	3.1	4.2	58.7	60.5	60.5	56.9	62.3	64.7	70.2	75.4	73.8	143.8	130.4	0.5	11.0						
	Percentages.																															
	Percentages.																															

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 6.19 a. m., 2.19 p. m., and 10.19 p. m. local time. Correction for time and elevation neglected. From 6.19 a. m. to 7.19 a. m. and from 2.19 p. m. to 3.19 p. m. inclusive, +.004 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

M. MCGAURAN  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PHILADELPHIA, PA.

[Latitude, 39° 57' N.; longitude, 75° 9' W. Magnetic variation, 30° W. Elevation of barometer above sea-level, 92 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 106 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Month.	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Washington time.				Miles.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 a. m.	3 p. m.	11 p. m.	In.						In.	In.	In.	In.	In.	Monthly mean.	Maximum.	Date.				Minimum.	Date.	Absolute range.	7 a. m. to 3 p. m.				3 p. m. to 11 p. m.	11 p. m. to 7 a. m.	Miles.	Miles.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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January.

July.

March.

February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.		Washington time.						Number of days—						Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).												
										Total amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.		11 p. m.	Mean.						
1888.																														
Jan.	11	26	1	2	1	22	7	22	7	4.330.80	20.21	6.4	7.6	6.5	6.8	22.0	23.8	24.4	23.4	76.9	81.6	70.9	8	12	16	9	0	24	0	0
Feb.	2	9	1	8	3	13	7	4	13	5.041.94	10.11	6.8	6.5	4.6	6.0	23.4	27.1	28.9	27.1	61.4	75.5	69.3	4	14	10	1	16	0	0	0
Mar.	8	11	2	6	5	18	7	4	13	2.020.79	30	4.5	3.6	3.4	3.8	23.8	28.8	29.8	28.8	69.3	65.7	65.1	11	17	8	1	16	0	0	0
Apr.	13	21	3	6	5	17	4	4	13	2.440.75	26.29	6.2	4.8	3.6	3.4	41.0	45.6	43.7	43.4	83.5	80.2	83.8	7	16	8	15	0	0	0	0
May	7	20	6	10	7	13	14	0	0	0.911.02	21.27	4.8	3.7	4.3	4.1	53.1	60.5	55.5	56.4	86.0	71.8	88.8	12	14	5	10	0	0	0	0
June	9	6	15	13	26	9	16	0	0	0.911.07	8.9	3.4	4.5	2.8	3.6	67.1	72.7	67.3	69.0	91.4	77.8	88.8	10	15	5	13	0	0	0	0
July	9	10	0	14	26	9	16	0	0	1.781.10	2	3.4	4.9	1.7	2.0	63.1	68.8	64.8	66.2	84.6	76.0	86.6	19	9	0	0	0	0	0	0
Aug.	15	21	5	2	4	19	7	18	2	2.402.86	24	4.0	4.9	5.0	5.0	56.8	61.6	59.1	59.2	86.7	72.6	89.3	8	15	7	10	0	0	0	0
Sept.	15	24	4	6	5	20	4	14	1	4.241.94	23.24	4.9	5.7	4.4	5.0	46.7	50.8	49.0	48.8	83.4	70.8	83.9	12	10	9	13	0	0	0	0
Oct.	13	82	7	6	5	11	7	17	7	1.840.45	26.37	5.3	4.6	3.4	3.9	37.2	39.9	38.2	38.8	77.5	65.5	76.9	16	6	8	9	0	0	0	0
Nov.	4	11	1	2	9	81	7	20	6	2.761.15	23.24	5.3	5.9	5.8	4.4	29.3	32.0	30.8	30.7	80.6	73.6	79.8	7	14	10	11	3	14	0	0
Dec.	8	14	4	4	4	20	6	7	7																					
Sums	109	305	44	66	77	250	96	220	23	38.17	59.1	100.249.856.1532.5383.7	590.6	538.9	583.4	583.4	583.4	583.4	583.4	583.4	123	154	88	180	15	74	7			
Percentages.																														
Means. 9.913.84 0.67 0.22 9.8 8.920.02 6 6 34 42 24 35.6 4.120.81 9																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7.08 a. m., January 1, to 11.08 p. m., December 31, inclusive,  $\pm$ .008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.110; February, 0.110; March, 0.100; April, 0.100; May, 0.100; June, 0.100; July, 0.100; August, 0.100; September, 0.100; October, 0.100; November, 0.100; December, 0.110.

T. F. TOWNSEND,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

## PIKE'S PEAK, COLO.

[Latitude, 38° 50' N.; longitude, 105° 2' W. Magnetic variation 14° 30' E. Elevation of barometer above sea-level, 14,134 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).					Temperature.					Wind.																	
	Washington time.			Monthly mean.	Range.	Washington time.			Self-registering thermometers.		Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.												
	7 a. m.	3 p. m.	11 p. m.			7 a. m.	3 p. m.	11 p. m.	Date.	Maximum.			Minimum.	Date.	Absolute range.													
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.	Total.	Miles.	Direction.	Date.								
Jan .....	17.442	17.458	17.473	17.458	17.836	23.16.925	20	831	2.1	0.5	2.8	0.5	0.5	0.5	0.5	0.5	3,150	3,128	19,538	N. E.	3							
Feb .....	17.562	17.593	17.617	17.598	18.013	27.17.079	2	834	10.2	7.5	3.6	4.4	28.0	21	27.0	2.553	1,598	6,223	N. W.	18								
Mar .....	17.692	17.719	17.711	17.707	18.035	21.17.407	31	648	8.6	16.6	11.1	12.1	29.0	27	3.0	2,864	1,054	1,184	N. W.	28								
Apr .....	17.569	17.621	17.636	17.605	17.985	16.16.887	21	1,098	15.6	23.9	19.1	19.5	32.0	7	3.0	6,109	4,427	5,136	N. W.	8								
May .....	17.740	17.788	17.800	17.776	18.045	20.17.260	17	785	28.0	35.4	30.5	31.3	32.0	23	13.0	4,521	4,371	4,704	N. W.	14								
June .....	17.980	18.007	18.009	17.999	18.231	20.17.715	9	516	35.5	44.2	37.7	38.6	53.0	30	31.0	8,926	3,868	3,788	N. W.	29								
July .....	18.106	18.132	18.126	18.121	18.283	18.17.985	13	298	34.9	43.4	38.6	39.1	57.0	2	7.0	3,788	2,784	2,608	N. W.	17								
Aug .....	18.147	18.166	18.161	18.158	18.291	20.18.042	11	249	27.0	35.0	28.6	30.2	40.0	2	5.0	3,881	3,276	3,120	N. W.	1								
Sept .....	18.034	18.069	18.062	18.062	18.283	4.17.808	23	475	27.0	35.0	28.6	30.2	40.0	2	5.0	4,946	4,359	4,020	N. W.	1								
Oct .....	17.718	17.736	17.743	17.732	17.981	5.17.335	28	646	13.5	20.1	15.7	16.4	33.0	30	13.0	5,705	5,021	4,978	N. W.	24								
Nov .....	17.727	17.731	17.734	17.727	18.116	29.17.308	22	808	11.2	17.3	12.8	13.8	31.0	30	13.0	10,789	10,672	10,527	N. W.	25								
Dec .....	17.618	17.629	17.649	17.632	18.029	10.17.261	18	768	7.5	10.5	6.4	8.1	23.0	1	32.0	10,789	10,672	10,527	N. W.	25								
Sums,	213.876	213.649	213.701	213.875	.....	.....	.....	.....	190.371	4.213.024.8	.....	.....	.....	.....	.....	305.0	151.0	.....	.....	.....								
Means.	17.781	17.804	17.808	17.798	18.291	*23.16.887	121	.....	15.9	22.6	17.8	18.8	57.0	*23	37.0	.....	Averages.	.....	.....	.....								
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\* For 184 days.      \* For 184 days.  
 † Anemometer broken.      \* August.  
 ‡ 229 miles lost by self-register.      † April.  
 § 540 miles lost by self-register.      ‡ July.  
 § 507 miles lost by self-register.      § 507 miles lost by self-register.  
 § 838 miles lost by self-register.      § 838 miles lost by self-register.  
 § 21 miles lost by self-register.      § 21 miles lost by self-register.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—						Remarks.					
	Number of calms.									Any 3 consecutive hourly measurements.	Cloudiness (in tenths.)			Dew-point.			Relative humidity (per cent.)				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.		Minimum above 30°.				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								11 p. m.	Mean.		
1883.																															
Jan.....	8	11	0	0	0	20	23	31	0	54	20	28	30	2.8	5.5	4.9	4.7	0	0	0	0	0	0	0	0	0	0	0	0		
Feb.....	6	8	0	0	3	43	14	11	0	49	15	23	25	3.2	3.6	2.7	3.2	2.0	0	0	0	0	0	0	0	0	0	0	0		
Mar.....	10	15	1	0	8	24	14	19	0	61	27	31	31	4.5	4.4	3.1	4.0	4.7	12.1	7.7	8.2	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	
Apr.....	7	8	0	0	6	37	14	19	0	1.68	21	23	23	4.5	6.7	4.6	4.9	4.8	12.6	7.7	8.4	86.1	84.5	83.5	85.7	85.7	85.7	85.7	85.7	85.7	
May.....	4	10	0	0	2	42	10	25	0	2.60	70	19	19	3.5	6.6	4.5	4.9	12.7	19.3	14.9	13.6	87.8	82.5	83.5	84.6	84.6	84.6	84.6	84.6	84.6	
June.....	8	14	1	0	3	40	9	10	0	1.76	68	11	12	1.6	8.9	2.3	3.3	22.7	29.0	23.1	25.9	80.6	78.9	84.7	81.4	81.4	81.4	81.4	81.4	81.4	
July.....	6	22	1	4	4	30	15	11	0	6.37	1.30	0.7	1.2	1.7	5.1	3.6	3.4	27.5	31.8	29.8	29.8	77.7	69.1	74.9	71.7	71.7	71.7	71.7	71.7	71.7	
Aug.....	8	16	3	7	6	32	10	11	0	2.22	53	1.2	1.0	4.0	4.3	2.7	2.8	28.4	31.6	30.8	30.8	80.6	71.6	80.6	77.6	77.6	77.6	77.6	77.6	77.6	
Sept.....	7	30	0	1	3	27	8	14	0	1.76	62	13	14	2.3	3.4	1.6	2.4	9.3	16.9	11.5	12.2	83.0	83.1	83.2	83.1	83.1	83.1	83.1	83.1	83.1	
Oct.....	3	0	0	0	2	39	29	18	2	0.07	63	20	1	1.1	3.6	0.8	1.8	2.5	5.5	1.8	3.3	72.3	73.5	78.4	75.4	75.4	75.4	75.4	75.4	75.4	
Nov.....	3	7	2	0	1	17	33	18	2	.72	36	23	23	3.4	4.3	2.4	3.4	2.5	5.5	1.8	3.3	80.5	80.1	81.3	80.6	80.6	80.6	80.6	80.6	80.6	
Dec.....	10	13	6	0	8	14	23	22	2	.72	36	23	23	3.4	4.3	2.4	3.4	2.5	5.5	1.8	3.3	80.5	80.1	81.3	80.6	80.6	80.6	80.6	80.6	80.6	
Sums ..	82	154	14	21	33	304	208	206	10	18.17	.....	.....	.....	30.9	61.0	37.8	43.2	123.8	119.2	9.154	4.163	5.970	1.923	3.934	0.961	2	0	0	0	0	
Means ..	7.514	11.371	9.3	0.63	2.19	0.19	1	0.9	.....	2.6	5.1	3.2	3.6	10.7	10.1	12.9	12.2	80.8	77.4	82.0	80.1	44.1	43.0	9.938	2.67	4.81	1	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.07 a. m., 1.07 p. m., and 9.07 p. m., local time.

Correction for instrumental error of barometer used: From 5.07 a. m., January 1, to 9.07 p. m., December 31, inclusive, + .043 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 12.70; February, 12.72; March, 12.69; April, 12.28; May, 12.06; June, 11.82; July, 11.78; August, 11.79; September, 11.98; October, 12.28; November, 12.06; December, 12.06.

H. HALL,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PIOCHIE, NEV.

[Latitude, 37° 59' N.; longitude, 114° 28' W. Magnetic variation, 18° E. Elevation of barometer above sea-level, 6,110 (B) feet. Elevation of exposed thermometer above round, 9 feet. Elevation of rain-gauge above ground, 23 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.				Maximum hourly velocity during month.	Direction from—	Date.			
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Washington time.				Total.				Miles.		
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	7 p. m.						8 p. m.	11 p. m.
1883.	<i>I<sub>W</sub></i>	<i>I<sub>W</sub></i>	<i>I<sub>W</sub></i>	<i>I<sub>m</sub></i>	<i>I<sub>H</sub></i>																	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>					
Jan	24.677	24.051	24.049	24.062	24.458	823.618	17	1.840	20.2	36.2	28.0	28.0	28.255	4	31	19.5	2071.9	53.0	39.4	18.5	1.287	1.885	1.956	1.856	4,028	32	N.	7		
Feb	23.895	24.012	24.016	24.009	24.492	772.239	1	1.163	21.5	37.0	28.0	28.0	237.0	21	22	1.0	553.0	40.2	38.2	13.2	1.499	1.808	1.819	1.835	4,835	31	N.	14		
Mar	24.015	24.015	24.005	24.012	24.510	812.694	29	.646	37.5	35.4	43.0	43.0	46.0	68.5	21	72	19.42	57.9	34.0	24.0	1.254	1.708	2.043	5,010	37	N.	18			
Apr	23.880	23.907	23.900	23.899	24.574	812.436	20	.938	38.5	36.3	42.0	42.0	42.1	68.0	29	77.2	19.60	53.9	30.5	20.5	1.446	2.128	2.404	5,968	36	N.	21			
May	23.958	23.967	23.963	23.961	24.235	802.736	1	.569	43.5	36.0	42.0	42.0	42.1	64.0	27	35.0	20.90	62.3	32.6	1	1.439	2.313	2.683	6,412	34	S.	5			
June	24.063	24.069	24.021	24.068	24.255	622.630	11	.425	54.8	72.1	64.1	64.1	64.0	64.0	10	37.0	19.49	77.0	30.8	1	.883	1.114	1.264	4,216	23	S.	14			
July																														
Aug																														
Sept																														
Oct																														
Nov																														
Dec																														
Sums																														
Means																														

B.—Elevation determined by barometer.

\* Fifteen days; station closed June 15, 1883.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.												Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Any consecutive 8 hourly measurements.	Cloudiness (in tenths).				Dew point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 50°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

Station closed June 15, 1883.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.30 a. m., 12.30 p. m., and 8.30 p. m., local time. Correction for instrumental error of barometer used: From 4.30 a. m., January 1, to 3.30 p. m., June 15, inclusive, +.003 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.20; February, 6.16; March, 6.14; April, 5.99; May, 5.92; June, 6.80; July, 6.73; August, 6.70; September, 6.78; October, 6.82; November, 6.18; December, 6.17.

F. R. DAY,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PITTSBURG, PA.

[Latitude, 40° 32' N.; longitude, 80° 2' W. Magnetic variation, 10 15' W. Elevation of barometer above sea-level, 766 feet. Elevation of exposed thermometer above ground, 86 feet. Elevation of rain-gauge above ground, 86 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.											
Month.	Washington time.			Monthly mean.		Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	<i>W.</i>	Monthly mean.					Maximum.	Minimum.	Date.	Absolute range.	11 p. m. to 7 a. m.	3 p. m. to 11 p. m.			7 a. m. to 3 p. m.	7 a. m. to 11 p. m.	3 p. m. to 7 a. m.	Total.	Miles.	Miles.	Direction from—	Date.
1883.																									
Jan.....	29.324	29.292	29.296	29.304	29.740	28.752	10	.988	25.8	31.6	28.3	28.654	0.21	30	1.0	23.53	33.9	20.8	1,207	1,630	1,873	4,270	25	W.	21
Feb.....	29.419	29.398	29.396	29.404	29.790	28.919	7	.871	31.9	38.3	35.2	35.176	5	16.13	0.27	63.5	43.7	25.9	1,406	1,770	1,424	4,600	24	W.	25
Mar.....	29.188	29.139	29.185	29.174	29.677	28.576	10	1.101	30.8	40.0	32.7	34.569	0	18.11	0	55.8	43.4	24.7	1,496	2,151	1,787	5,434	25	W.	12
Apr.....	29.194	29.134	29.188	29.172	29.473	28.825	23	.648	44.4	57.6	48.9	50.386	0	14.26	5	159.5	60.8	40.8	828	1,618	1,297	3,713	24	W.	11
May.....	29.168	29.123	29.145	29.145	29.467	28.521	21	.946	54.7	69.0	58.4	60.790	0	4.39	0	17.51	72.5	50.3	876	1,755	1,337	3,968	26	SW.	10
June.....	29.190	29.144	29.166	29.167	29.532	28.851	10	.701	64.9	78.8	67.9	70.590	0	5	17.48	5	81.0	61.8	896	1,694	1,285	3,815	24	W.	11
July.....	29.247	29.200	29.226	29.224	29.424	28.914	12	.510	67.1	81.2	70.1	72.890	0	3.55	5	142.5	84.4	63.6	801	1,654	1,338	2,793	20	SW.	23
Aug.....	29.289	29.242	29.266	29.266	29.470	28.968	2	.502	62.0	70.1	67.1	66.494	0	22.51	6	642.5	80.9	59.9	606	1,355	1,130	3,091	17	SW.	23
Sept.....	29.307	29.239	29.274	29.273	29.625	28.801	24	.824	56.7	70.9	60.7	62.893	0	16.39	4	93.6	74.0	53.5	823	1,472	1,179	3,476	27	SW.	24
Oct.....	29.328	29.288	29.317	29.311	29.785	28.607	2	1.178	50.8	61.5	53.6	55.385	0	10.33	5	16.52	63.7	47.5	893	1,472	1,181	3,476	23	SW.	29
Nov.....	29.347	29.293	29.329	29.323	29.783	28.870	9	.913	42.1	52.0	45.7	46.773	0	9.15	3	16.57	55.3	38.0	1,561	2,105	1,728	5,394	21	NW.	12
Dec.....	29.284	29.251	29.274	29.270	29.640	28.762	27	.878	33.3	41.2	35.6	36.764	0	7.15	0	16.49	44.6	28.1	1,481	1,816	1,730	5,030	22	W.	28
Sums..	351.285	350.744	351.072	351.033	.....	.....	.....	.....	564.5	701.2	604.2	623.3	.....	740.2	514.9	14,443	20,202	16,504	49,149	.....	.....	.....	.....	.....	.....
Means.	29.274	29.229	29.256	29.253	29.790	28.521	121	.....	\$7.0	58.4	50.4	51.996	0	13.5	1.0	\$23	61.7	42.9	1,036	91,683	51,375	3	.....	.....	.....

One 11 p. m. observation missed.

February.

May.

July.

January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.		Washington time.						Number of days—			Remarks.								
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	60 inch or more of water.	Minimum below 32°.	Maximum below 32°.	Maximum above 90°.	
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.
1883.																											
Jan	8	12	6	3	11	13	16	14	9	3.22	0.74	27.28	23.1	23.9	74.5	81.2	79.6	3	10	18	18	8	26	0			
Feb	5	7	9	2	9	13	20	14	5	4.92	1.35	0.7	23.0	22.9	63.6	74.7	72.7	4	14	10	17	2	22	0			
Mar	11	14	2	4	9	15	11	28	1	2.51	1.01	30	28.0	27.0	59.5	68.2	65.2	7	14	10	15	4	24	0			
Apr	10	18	7	3	12	6	6	20	8	3.69	1.04	22	28.0	28.0	53.5	71.3	66.7	10	10	10	14	0	0	0			
May	5	9	5	4	16	18	10	15	11	5.38	1.30	14	38.0	38.0	50.2	70.7	64.2	10	12	9	0	0	0	0			
June	7	6	8	28	10	16	7	7	7	4.73	1.23	18	48.0	48.0	53.0	76.1	70.2	11	13	5	18	0	0	0			
July	9	5	3	1	17	20	12	22	8	5.52	1.44	23	50.0	50.0	53.0	76.1	70.2	11	13	5	18	0	0	0			
Aug	14	16	9	2	3	6	15	20	8	3.40	1.84	23	50.0	50.0	53.0	76.1	70.2	11	13	4	10	0	0	0			
Sept	10	8	5	5	6	9	4	11	32	2.47	0.78	28	51.0	51.0	53.0	76.1	70.2	8	12	10	12	0	0	0			
Oct	9	24	10	4	10	9	8	14	5	2.43	0.87	28	51.0	51.0	53.0	76.1	70.2	6	13	12	10	0	0	0			
Nov	4	4	6	8	24	13	17	11	3	1.50	0.29	9	36.4	36.4	53.0	76.1	70.2	7	13	10	19	1	9	0			
Dec	6	11	5	4	18	12	20	14	1	3.40	1.47	23	32.8	30.7	74.0	82.4	80.7	3	10	18	19	7	20	0			
Sums	100	185	69	48	161	144	155	186	95	43.17	.....	72	503.6	507.9	502.7	790.4	833.2	97	147	120	167	22	105	11			
Means	8.1	12.3	6.3	4.1	13.7	12.1	13.7	17.2	8.7	.....	.....	.....	41.9	42.4	58.4	74.9	71.1	26.0	40.4	33.0	45.8	6.0	28.9	3.0			
	Percentages.																				Percentages.						

One 11 p. m. observation misad.

Note.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time.

Corrections for instrumental errors of barometer used: From 6.48 a. m., January 1, to 6.48 a. m., December 26, inclusive, +.009 inch; from 10.48 a. m., December 26, to 10.48 p. m., December 31, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.850; February, 0.860; March, 0.860; April, 0.860; May, 0.860; June, 0.790; July, 0.790; August, 0.790; September, 0.790; October, 0.820; November, 0.860; December, 0.860.

J. N. BYKER,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## FOPLAR RIVER, MONT.

[Latitude, 48° 8' N.; longitude 105° 10' W. Magnetic variation, —° W. Elevation of barometer above sea-level, 2,020 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	In.	Washington time.			Self-registering thermometers.			Mean maximum.		Mean minimum.		Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7 a. m.	3 p. m.	11 p. m.								Maximum.	Date.	Minimum.	Date.	Absolute range.	Total.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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B.—Elevation determined by barometer.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PORT HURON, MICH.

Latitude, 43° N. longitude, 82° 26' W. Magnetic variation, 10° W. Elevation of barometer above sea-level, 683 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 63 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.								Wind.							
	Washington time.					Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Washington time.			Total.	Direction from—	Maximum hourly velocity during month.	
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	7 a. m.							3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.				8 p. m.
1883.																										
Jan.	29.419	29.878	29.407	29.401	29.839	428.728	29.111	18.6	31.1	18.0	16.0	32.4	18.9	32.1	18.0	16.0	32.4	18.9	32.1	18.0	16.0	32.4	18.9	32.1	18.0	16.0
Feb.	29.507	29.479	29.489	29.482	29.528	228.968	24.045	18.6	24.1	18.9	20.2	20.8	19.0	20.6	19.0	20.2	20.8	19.0	20.6	19.0	20.2	20.8	19.0	20.6	19.0	20.2
Mar.	29.303	29.296	29.288	29.286	29.791	228.628	10.103	19.3	27.8	23.5	22.6	24.8	23.5	23.6	23.5	22.6	24.8	23.5	23.6	23.5	22.6	24.8	23.5	23.6	23.5	22.6
Apr.	29.279	29.292	29.283	29.275	29.536	228.773	11.768	19.3	33.8	33.5	40.0	31.4	34.0	33.8	40.0	31.4	34.0	33.8	40.0	31.4	34.0	33.8	40.0	31.4	34.0	33.8
May	29.253	29.232	29.249	29.246	29.406	228.928	27.061	22.7	46.1	43.7	43.0	43.7	43.7	43.0	43.7	43.0	43.7	43.7	43.0	43.7	43.0	43.7	43.7	43.0	43.7	43.0
June	29.210	29.196	29.191	29.192	29.646	182.771	10.877	20.1	68.8	60.4	68.1	58.0	60.4	68.1	58.0	60.4	68.1	58.0	60.4	68.1	58.0	60.4	68.1	58.0	60.4	68.1
July	29.273	29.251	29.265	29.256	29.631	182.938	12.048	22.0	64.8	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
Aug.	29.360	29.324	29.335	29.340	29.591	142.053	2.688	22.0	68.8	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
Sept.	29.389	29.337	29.343	29.346	29.765	102.758	24.077	52.0	62.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6
Oct.	29.412	29.383	29.390	29.396	29.953	162.584	29.149	43.6	51.8	44.1	47.0	47.0	44.1	47.0	44.1	47.0	44.1	47.0	44.1	47.0	44.1	47.0	44.1	47.0	44.1	47.0
Nov.	29.336	29.312	29.331	29.331	29.831	162.718	9.124	35.8	42.7	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9
Dec.	29.309	29.297	29.304	29.313	29.783	222.866	37.057	24.8	80.4	78.6	77.1	78.6	78.6	77.1	78.6	77.1	78.6	77.1	78.6	77.1	78.6	77.1	78.6	77.1	78.6	77.1
Sums.	352.052	351.707	351.914	351.889	.....	.....	472.8	568.4	498.0	512.4	.....	616.9418.1	28.949	31.706	28.104	38.849	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means.	29.338	29.309	29.326	29.324	29.943	*162.834	*29	38.4	47.1	41.3	42.7	38.5	42.2	41.7	41.3	42.2	38.5	42.2	41.7	41.3	42.2	38.5	42.2	41.7	41.3	42.2

\* For 27 days.

\* For 27 days.

\* October.

† August.

† January.

Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Rainfall or melted snow.	Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
North.		Northeast.		East.		Southeast.		South.			Southwest.		West.		Northwest.		Number of calms.	Any 3 con- secutive 8 hourly measure- ments.	Cloudiness (in tenths).			Dew-point.				Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
North.	North- west.	East.	East- south- east.	South.	South- west.	West.	North- west.	Total amount.	Date.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.			11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time.

Correction for instrumental error of barometer used: From 6.38 a. m., January 1, to 10.38 p. m., December 31, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by the following constants for the various months: January, 0.730; February, 0.730; March, 0.730; April, 0.700; May, 0.680; June, 0.670; July, 0.660; August, 0.660; September, 0.670; October, 0.690; November, 0.720; December, 0.730.

M. H. PERRY.  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76 — *Met. o. logical summary for the year ending December 31, 1883—Continued.*

## PORTLAND, ME.

\*[Latitude, 43° 30' N.; longitude, 70° 15' W. Magnetic variation, 13° 15' W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.			Monthly mean.	Higheest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Washington time.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.		Mean minimum.	7 a. m. to 11 p. m.	3 p. m. to 7 a. m.	11 p. m. to 3 p. m.	Total.	Miles. Mph.	Miles. Mph.	Miles. Mph.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.27 a. m., 3.27 p. m., and 11.27 p. m., local time. Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., December 31, inclusive, +.001 inch. The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

W. W. EICHELBERGER,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## PORTLAND, OREG.

[Latitude, 45° 32' N.; longitude, 123° 43' W. Magnetic variation, 21° E. Elevation of barometer above sea-level, 67 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 60 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.													
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.				Total.	Miles.	Direction from—	Maximum hourly velocity during month.			
	7 a. m.	3 p. m.	11 p. m.						Maximum.	Minimum.	Date.	Absolute range.	7 a. m. to 11 p. m.	8 p. m. to 11 p. m.			11 p. m. to 7 a. m.	7 a. m. to 8 p. m.	8 p. m. to 11 p. m.	11 p. m. to 7 a. m.							
1883.	<i>I<sub>u</sub>.</i>	<i>I<sub>u</sub>.</i>	<i>I<sub>u</sub>.</i>	<i>I<sub>u</sub>.</i>	<i>I<sub>u</sub>.</i>	<i>I<sub>u</sub>.</i>			<i>I<sub>u</sub>.</i>									<i>Miles.</i>								<i>Date.</i>	
Jan.	30.146	30.119	30.110	30.125	30.682	19.28	408	24	1.194	35.4	39.1	38.1	37.5	35.6	31	8.0	19.47	6.44	3.32	1,267	1,433	1,316	4,016	30	SE	19	
Feb.	30.177	30.163	30.133	30.163	30.649	4.28	345	12	1.304	28.9	36.6	33.4	33.0	30.0	27	7.0	5.53	0.42	23.8	716	1,005	1,404	3,124	30	SE	5	
Mar.	29.962	29.967	29.928	29.952	30.281	15.28	266	28	1.015	43.9	53.7	51.6	50.4	47.5	21	34.0	7.41	0.61	41.1	700	935	1,115	2,750	22	S.	30	
Apr.	29.928	29.920	29.917	29.922	30.259	22.28	503	19	.756	43.7	54.1	49.7	49.2	47.2	35	36.2	23.38	0.50	42.1	1,033	1,371	1,624	4,028	24	S.	11	
May	29.956	29.947	29.922	29.942	30.326	24.28	532	12	.744	49.8	63.2	59.3	57.4	54.0	11	40.0	15.44	0.80	48.4	1,151	1,330	1,893	4,284	24	W.	30	
June	30.023	30.015	29.979	30.006	30.351	5.28	745	16	.906	54.1	68.5	64.5	63.4	57.0	19	44.0	43.0	0.76	53.5	1,033	1,099	1,764	3,806	16	NW.	10	
July	30.006	29.988	29.934	29.979	30.175	19.28	711	7	.804	57.5	72.2	71.1	68.9	64.0	22	43.0	15.40	0.80	57.0	1,023	1,116	1,764	3,847	16	S.	10	
Aug.	30.016	30.016	29.982	30.006	30.273	19.28	762	8	.511	55.7	67.8	64.8	62.8	58.0	22	43.0	31.30	0.73	54.2	958	637	1,173	2,289	14	N.	19	
Sept.	30.044	30.034	29.916	29.934	30.179	19.28	657	29	.622	54.4	66.7	62.6	61.2	57.0	21	44.0	19.42	0.72	52.6	958	901	1,112	2,701	20	SE	19	
Oct.	29.960	29.972	29.963	29.963	30.305	20.28	374	25	.831	47.4	54.8	50.6	50.8	46.2	15	37.0	31.27	0.65	43.8	1,077	1,237	1,369	3,730	27	S.	25	
Nov.	30.028	30.031	30.014	30.041	30.378	11.28	474	24	.904	44.1	49.8	46.1	46.8	40.0	10	33.5	8.28	0.52	42.0	1,311	1,278	1,328	3,917	33	S.	23	
Dec.	30.041	30.045	30.030	30.045	30.483	31.28	322	25	1.161	39.4	44.0	41.4	41.8	36.4	29	24.2	31.32	0.49	36.8	1,237	1,234	1,415	3,876	34	S.	24	
Sum.	360.187	360.127	359.900	360.076	.....	.....	.....	.....	554.3	673.1	635.2	620.9	.....	.....	.....	.....	730.2	531.8	.....	11,095	13,016	17,057	42,968	.....	.....	.....	
Mean.	30.010	30.011	29.992	30.000	30.662	19.28	266	28	46.2	56.1	52.9	51.7	49.4	.....	17	7.0	58	61.6	44.3	974.6	1,134	71.4	421.4	.....	.....	.....	
.....										* January.			† March.			‡ July.			§ February.					Average.			.....

(\*) On 7 a. m. observation missed.

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Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—		Remarks.										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Rain.	Cloudy.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.		7 a. m.							3 p. m.	11 p. m.	Mean.
1883.																													
Jan.	6	4	9	4	33	1	1	10	19	7.1	6.86	5.6	7.8	31.7	33.8	34.0	33.2	84.3	4	10	17	19	3	12	0	0			
Feb.	10	8	22	12	18	7	4	9	20	7.14	6.88	18.19	4.0	31.2	25.9	24.3	23.6	73.7	11	11	5	19	3	15	0	0			
Mar.	7	1	7	18	6	4	6	16	22	6.28	2.25	28.28	4.0	29.5	42.8	42.8	41.9	85.1	18	3	10	0	0	0	0	0			
Apr.	10	10	18	12	18	7	4	30	20	7.98	1.84	10.6	4.0	40.1	40.4	41.2	40.6	87.9	2	12	16	20	0	0	0	0			
May	11	0	1	2	20	2	6	16	12	7.51	1.67	5.1	4.0	44.6	44.5	44.8	44.9	81.9	14	11	8	0	0	0	0	0			
June	20	0	0	0	6	0	0	0	10	6.06	0.6	10.6	4.2	47.7	48.5	50.5	48.9	79.5	16	14	11	0	0	0	0	0			
July	21	0	0	0	7	0	0	0	10	6.06	0.6	10.6	4.2	47.7	48.5	50.5	48.9	79.5	16	14	11	0	0	0	0	0			
Aug.	12	0	0	0	6	1	4	10	21	6.18	1.18	1.2	1.5	50.5	53.1	54.8	52.8	83.8	25	5	2	3	0	0	0	0			
Sept.	12	0	0	0	6	1	4	10	21	6.18	1.18	1.2	1.5	50.5	53.1	54.8	52.8	83.8	25	5	2	3	0	0	0	0			
Oct.	7	2	5	1	23	10	13	11	23	8.7	17.18	3.85	3.8	50.6	50.1	50.9	50.5	88.1	19	7	4	11	0	0	0	0			
Nov.	3	0	0	0	20	15	9	8	31	1.07	1.07	24.27	7.1	8.3	5.7	44.4	44.6	89.4	4	11	16	17	0	0	0	0			
Dec.	3	4	11	2	30	15	6	1	14	3.26	3.62	24.27	6.5	8.7	8.7	42.5	42.5	92.3	6	13	11	14	0	0	0	0			
Sums	131	26	62	18	246	85	72	222	221	51.45	50.4	56.348	6.58	1499.3	515.2	522.3	512.31	6888.8	134	114	115	135	8	30	2	2			
Means	12.02	4.71	6.22	5.77	8.0	3.21	2.90	2	19.2	5.0	5.5	4.0	4.8	41.6	42.9	43.5	42.7	84.5	64.2	73.0	73.9	36.9	31.4	31.7	30.3	20.5			
Percentages.																													

1 One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m.

Correction for instrumental error of barometer used: From 3.57 a. m., January 1, to 7.57 p. m., December 31, inclusive, —.028 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

M. L. HEARNE,  
Sergeant, Signal Corps, U. S. A.

Washington time, correspond with 3.57 a. m., 11.57 a. m., and 7.57 p. m. local time.  
 Correction for instrumental error of barometer used: From 3.57 a. m., January 1, to 7.57 p. m., December 31, inclusive, —.028 inch.  
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

PRESCOTT, ARIZ.

[Latitude, 34° 33' N. longitude, 112° 29' W. Magnetic variation, 14° E. Elevation of barometer above sea level, 5,340 (B) feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 3 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Winds.							
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.						Mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction
1883.																						
Jan.....	24,701	24,774	24,798	24,788 25,109	8,24	19,715	19,715	24,0	45,4	34,1	34,5 64,3	31	-8,5	20,72,8	44,3	32,5	1,553	1,905	4,017	SW.	17	
Feb.....	24,731	24,739	24,757	24,742 25,131	17,24	24,325	15,806	27,6	47,4	37,9	37,6 63,5	19	28	16,61,0	42,0	25,8	1,175	2,882	5,045	SW.	12	
Mar.....	24,752	24,739	24,741	24,744 24,956	2,24	24,504	29,452	36,1	57,0	47,3	47,4 72,0	26	31,5	14,0,5	61,8	41,1	1,047	1,367	2,821	N.	19	
Apr.....	24,654	24,664	24,663	24,660 25,075	15,24	24,286	12,789	37,9	58,7	48,9	47,9 76,0	16	23,2	15,52,8	59,0	42,1	1,491	2,429	3,375	7,295	40	
May.....	24,719	24,721	24,727	24,722 24,937	20,24	24,521	16,416	43,1	68,9	57,4	56,9 88,8	27	29,0	3,59,8	69,8	48,4	1,185	2,320	3,103	6,608	31	
June.....	24,782	24,776	24,771	24,776 24,967	30,24	24,603	8,294	52,4	84,1	70,6	69,0 98,5	25	41,5	16,57,0	76,0	53,5	827	1,757	2,919	5,503	SW.	11, 15
July.....	24,857	24,852	24,844	24,851 24,966	10,24	24,706	31,260	60,9	79,9	70,4	70,4 94,8	18	53,5	13,41,3	57,0	37,0	788	1,297	2,000	4,085	24	
Aug.....	24,879	24,885	24,874	24,879 24,977	28,24	24,761	11,216	60,1	80,5	69,8	70,1 93,5	26	52,1	13,41,3	54,2	37,0	687	1,028	1,836	3,641	N.	22
Sept.....	24,847	24,838	24,833	24,839 24,981	5,24	24,626	13,355	50,5	79,8	63,6	64,0 95,0	2	36,5	23,58,5	72,3	52,6	907	1,282	1,758	3,647	SW.	22
Oct.....	24,744	24,751	24,766	24,754 24,974	31,24	24,456	2,518	39,1	62,1	48,6	49,0 97,5	1	23,0	29,52,5	58,4	45,8	421	1,719	2,353	4,993	29	
Nov.....	24,818	24,809	24,823	24,817 25,076	29,24	24,551	19,525	28,9	57,4	41,3	42,5 97,0	2	18,5	26,27,54	52,0	42,0	675	1,314	1,649	3,698	SW.	12
Dec.....	24,817	24,823	24,831	24,824 25,087	8,25	24,550	4,537	32,7	48,9	38,8	40,1 90,8	17	19,5	8,40,3	49,0	36,8	1,059	1,464	1,719	4,242	40	
Sums.....	297,891	297,871	297,828	297,396	.....	.....	.....	493,3	769,6	628,7	630,4	.....	.....	.....	739,2	531,8	1,321	18,815	27,220	57,356	.....	
Means.....	24,783	24,781	24,786	24,783 25,131	17,24	24,286	112	.....	41,1	64,1	52,4	52,5 98,5	425	-8,5	\$20	61,6	44,3	943,4	1,567	9,2768,3	.....	

B.—Elevation determined by barometer. \* February. † April. ‡ June. § January.

### REPORT OF THE CHIEF SIGNAL OFFICER.

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[illegible]

**Inappreciable.**

**NOTE**—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4:38 a. m., 12:38 p. m., and 8:38 p. m., local time.

NOV.—1 a. m., 8 p. m., and 11 p. m.; Washington time, correspond with 4.38 a. m., 12.38 p. m., and 3.38 p. m., local time. Correction for instrumental error of barometer used: From 4.38 a. m., January 1, to 8.38 p. m., December 31 inclusive,  $-.010$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.88; February, 5.86; March, 5.84; April, 5.82; May, 5.10; June, 5.09; July, 4.99; August, 4.98; September, 5.10; October, 5.16; November, 5.84; December, 5.87.

**N. D. LANE,**

**N. D. LANE, Sergeant, Signal Corps, U. S. A.**

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## PROVINCETOWN, MASS.

[Latitude, 42° 3' N.; longitude, 70° 11' W. Magnetic variation, 11° 30' W. Elevation of thermometer above sea-level, 28 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 85 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.								
	Washington time.			Monthly mean.			Washington time.			Month.	Self-registering thermometers.			Mean maximum.			Washington time.			Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Date.	Range.	Date.	11 p. m.		Month.	Mean.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	3 p. m. to 11 p. m.	7 a. m. to 3 p. m.	Total.	Miles.	Direction from—	
																									7 a. m.
1883.	<i>I<sub>a</sub></i>	<i>I<sub>b</sub></i>	<i>I<sub>c</sub></i>	<i>I<sub>d</sub></i>	<i>I<sub>e</sub></i>	<i>I<sub>f</sub></i>	<i>I<sub>g</sub></i>	<i>I<sub>h</sub></i>	<i>I<sub>i</sub></i>	<i>I<sub>j</sub></i>	<i>I<sub>k</sub></i>	<i>I<sub>l</sub></i>	<i>I<sub>m</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>o</sub></i>	<i>I<sub>p</sub></i>	<i>I<sub>q</sub></i>	<i>I<sub>r</sub></i>	<i>I<sub>s</sub></i>	<i>I<sub>t</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>v</sub></i>	<i>I<sub>w</sub></i>	<i>I<sub>x</sub></i>	
Jan.	30.189	30.104	30.116	30.120	30.502	10	1.109	27.2	29.8	27.4	28.1	46.5	31	13	22	23	83.4	22.2	2.706	3.180	3.111	8.997	48	SE.	
Feb.	30.173	30.141	30.200	30.171	30.744	24	29.502	31.2	28.7	29.7	29.7	74.5	15	13	23	27	81.0	23.5	2.457	2.485	7.845	34	SE.		
Mar.	30.188	30.125	30.187	30.163	30.462	6	28.917	10	1.645	28.3	32.9	30.2	31.5	15	7	54	83.3	23.0	3.064	3.612	3.184	9.830	40	SE.	
Apr.	30.175	30.146	30.175	30.163	30.472	14	29.559	16	1.313	40.2	45.8	39.4	41.8	18	25	28	83.8	23.0	3.965	3.626	1.956	6.347	28	S.	
May.	30.159	30.123	30.148	30.128	30.434	1	29.533	15	1.901	52.7	58.3	50.8	53.9	21	30	37	82.4	45.4	2.100	2.577	2.988	6.975	32	SW.	
June.	30.182	30.183	30.190	30.183	30.501	2	29.498	11	1.018	65.5	72.5	62.0	66.7	24	50	137	82.4	45.4	1.846	2.312	2.141	6.299	27	S.	
July.	30.189	30.185	30.191	30.183	30.501	2	29.498	11	1.018	65.5	72.5	62.0	66.7	24	50	137	82.4	45.4	1.846	2.312	2.141	6.299	27	S.	
Aug.	30.187	30.182	30.191	30.183	30.501	3	29.498	11	1.018	65.5	72.5	62.0	66.7	24	50	137	82.4	45.4	1.846	2.312	2.141	6.299	27	S.	
Sept.	30.187	30.182	30.191	30.183	30.501	15	29.392	24	1.997	59.5	64.7	58.2	60.8	21	53	104	83.7	61.1	1.612	1.870	1.789	5.221	26	W.	
Oct.	30.187	30.182	30.191	30.183	30.501	17	29.372	30	1.840	49.1	52.5	48.6	50.7	13	45	113	87.8	53.0	2.202	2.649	2.707	7.068	43	N.E.	
Nov.	30.157	30.106	30.129	30.131	30.612	30	1.340	49.1	52.5	48.6	50.7	53.2	11	34	114	87.8	53.0	2.202	2.649	2.707	7.068	43	N.E.		
Dec.	30.167	30.065	30.066	30.069	30.527	23	29.512	37	1.015	42.4	45.7	43.1	47.3	6	22	28	83.0	37.5	2.562	3.211	2.674	8.047	39	SE.	
.....	30.037	29.968	30.066	30.014	30.605	12	1.448	31.9	34.3	32.5	32.9	50.0	9	0	29	50.4	38.6	3.061	3.169	2.872	9.102	37	W.		
Sums.	360.396	359.949	360.126	360.179	.....	.....	.....	583.4	617.6	550.0	575.3	.....	.....	.....	.....	664.5	190.5	27.067	32.019	23.444	87.580	.....	.....	.....	
Means.	30.033	29.996	30.016	30.015	30.744	.....	.....	46.5	51.5	45.8	47.9	93.0	16	0	4	52	53.4	40.9	2.553	2.683	2.370	3	.....	.....	.....

\* February.

† March.

‡ July.

§ December.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Any 3 consecutive 8 hourly measurements.	Rainfall or melted snow.	Washington time.										Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Rain.	Cloudy.	.01 inch or more of water.	Minimum below 32°.		Maximum below 32°.	Maximum below 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 7.27 a. m., 3.27 p. m., and 11.27 p. m., local time. Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., December 31, inclusive, —.001 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.03; February, 0.03; March, 0.03; April, 0.03; May, 0.03; June, 0.03; July, 0.03; August, 0.03; September, 0.03; October, 0.03; November, 0.03; December, 0.03.

CHAS. N. KITCHEN,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## PUNTA RASA, FLA.

[Latitude, 28° 29' N.; longitude, 82° 1' W. Magnetic variation, 4° E. Elevation of barometer above sea-level, 14 feet. Elevation of exposed thermometer above ground, 38 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).							Temperature.							Wind.											
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering thermometers.				Mean maximum.	Mean minimum.	Washington time.				Maximum hourly velocity during month.	Date.		
	7 p. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.		Maximum.	Date.	Minimum.	Date.			Absolute range.							
				Miles.	Direction from—	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.				Total.					Miles.	Direction from—								
1883.																										
Jan. 1	30.122	30.114	30.163	30.143	30.453	23	23.796	9	0.637	63.1	70.5	65.0	66.2	79.0	26	41.0	12	38.0	72.9	61.2	2,238	2,851	2,501	7,590	9	NW.
Feb.	30.202	30.148	30.113	30.113	30.188	28	30.016	23	0.488	65.7	77.5	68.9	70.7	83.0	9	52.0	28	31.0	73.2	64.9	1,912	2,474	2,829	6,715	27	NE.
Mar.	30.063	30.021	30.056	30.047	30.387	1	23.738	20	0.649	62.4	72.4	66.5	67.1	80.0	31	54.5	12	25.5	74.6	60.9	2,614	2,820	2,776	8,210	20	SW.
Apr.	30.001	29.968	30.004	29.991	30.106	3	23.753	22	0.413	71.8	79.9	73.6	75.1	86.5	13	61.0	17	25.5	82.4	69.4	2,284	2,963	2,987	8,193	16	NW.
May	30.026	29.988	30.020	30.010	30.158	24	23.665	21	0.498	72.2	79.9	73.7	75.3	87.5	10	57.5	24	30.0	82.3	68.9	2,117	2,453	2,605	7,264	1	SW.
June																										
July																										
Aug.																										
Sept.																										
Oct.																										
Nov.																										
Dec.																										
Sums																										
Means.																										

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Rainfall or melted snow.			Washington time.						Number of days—					Remarks.								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.			
										Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.
1888.																																
Jan.	5	25	14	13	24	5	1	5	0	1.29	0.58	9	5.7	5.6	4.9	5.4	59.8	61.6	60.2	60.5	89.8	74.7	85.1	83.2	9	11	10	6	0	0		
Feb.	5	18	38	8	8	8	1	3	0	0.01	0.01	10	3.6	4.5	3.0	3.7	61.3	62.3	62.0	61.9	86.8	60.6	79.5	75.6	15	10	8	1	0	0		
Mar.	8	15	10	7	20	9	9	15	0	6.64	3.46	19	20	5.4	5.1	3.9	4.8	55.7	56.8	53.2	56.9	79.4	60.7	75.5	71.9	10	15	6	1	0	0	
Apr.	7	14	16	7	14	19	6	6	1	2.70	2.05	4	3.5	4.6	1.7	3.3	66.0	65.7	65.6	65.8	82.7	63.3	77.0	74.3	11	18	1	5	0	0		
May	6	17	24	7	3	12	14	10	0	2.62	1.46	1	4.4	4.9	3.1	4.1	63.7	62.8	64.2	63.6	75.5	58.2	72.5	68.7	13	14	4	9	0	0		
June																																
July																																
Aug.																																
Sept.																																
Oct.																																
Nov.																																
Dec.																																
Sums.																																
Means.																																

<sup>1</sup> One 7 a. m. observation missed.

\* Station closed June 15.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.40 a. m., 2.40 p. m., and 10.40 p. m., local time.

Correction for instrumental error of barometer used: From 6.40 a. m., January 1, to 10.40 p. m., May 31, inclusive, —.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.01; February, 0.01; March, 0.01; April, 0.01; May, 0.01; June, 0.01; July, 0.01; August, 0.01; September, 0.01; October, 0.01; November, 0.01; December, 0.01.

W. J. EVANS,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

RED BLUFF, CAL.

Latitude, 40° 10' N.; longitude, 122° 15' W. Magnetic variation, 120 E. Elevation of barometer above sea-level, 332 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 36 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.									
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.						
	7 p. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.	Mon. by mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.
1898.																								
Jan.	29.912	29.919	29.884	29.905	30.293	29.486	2	1.777	35.4	45.7	42.5	41.2	65.0	31.19.0	19.46.0	19.46.0	19.46.0	19.46.0	19.46.0	19.46.0	19.46.0	19.46.0	19.46.0	19.46.0
Feb.	29.780	29.799	29.759	29.779	30.342	17.23	13	1.087	37.3	51.5	46.6	46.1	80.0	19.19.0	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
Mar.	29.648	29.658	29.615	29.640	29.870	17.23	27	1.663	48.9	62.4	60.0	58.3	63.0	16.43.0	71.1	46.7	1.874	1.874	1.874	1.874	1.874	1.874	1.874	1.874
Apr.	29.672	29.690	29.632	29.691	30.016	14.15	19	1.207	48.4	62.4	57.6	56.1	63.0	23.36.0	71.1	46.7	1.874	1.874	1.874	1.874	1.874	1.874	1.874	1.874
May	29.619	29.622	29.579	29.607	29.833	18.23	28	1.605	55.2	71.3	66.3	64.3	69.0	27.41.0	75.6	53.4	1.898	1.898	1.898	1.898	1.898	1.898	1.898	1.898
June	29.562	29.583	29.510	29.561	29.833	18.23	28	1.605	55.2	71.3	66.3	64.3	69.0	27.41.0	75.6	53.4	1.898	1.898	1.898	1.898	1.898	1.898	1.898	1.898
July	29.559	29.548	29.499	29.528	29.764	18.23	28	1.605	55.2	71.3	66.3	64.3	69.0	27.41.0	75.6	53.4	1.898	1.898	1.898	1.898	1.898	1.898	1.898	1.898
Aug.	29.539	29.597	29.525	29.560	29.749	18.23	28	1.605	55.2	71.3	66.3	64.3	69.0	27.41.0	75.6	53.4	1.898	1.898	1.898	1.898	1.898	1.898	1.898	1.898
Sept.	29.564	29.574	29.528	29.556	29.697	17.23	34	1.333	64.5	77.3	75.4	73.8	108.0	22.53.0	94.0	40.0	1.284	1.284	1.284	1.284	1.284	1.284	1.284	1.284
Oct.	29.654	29.659	29.628	29.642	29.857	29.283	26	0.675	50.9	64.1	58.2	57.7	78.0	11.30.0	68.8	49.3	1.412	1.412	1.412	1.412	1.412	1.412	1.412	1.412
Nov.	29.787	29.798	29.765	29.782	30.055	29.480	24	0.575	43.2	57.4	51.1	50.6	75.0	11.30.0	68.8	49.3	1.412	1.412	1.412	1.412	1.412	1.412	1.412	1.412
Dec.	29.795	29.812	29.797	29.801	30.110	31.28	33	0.717	38.4	49.7	45.2	44.4	71.0	14.23.0	61.7	41.4	1.187	1.187	1.187	1.187	1.187	1.187	1.187	1.187
Sums.	354.174	354.238	353.689	353.854	355.032	353.783	4	625.7	825.9	763.4	783.2	881.8	893.9	15.357	18.346	20.745	64.948	64.948	64.948	64.948	64.948	64.948	64.948	64.948
Means.	29.631	29.686	29.641	29.669	30.042	29.207	127	62.1	68.8	63.6	61.3	107.0	12.3	19.0	12.3	19.0	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3

\* February.

† March.

‡ July.

§ January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.				
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 con- secutive 8 hourly measure- ments.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Rain.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								
1883.																												
Jan.	53	1	4	1	17	0	22	12	3	96	24	3.0	30.6	82.0	63.3	18	9	4	0	0	0	0	0	0	0	0	0	0
Feb.	19	2	4	1	42	1	0	12	5	39	13	1.8	29.7	82.0	63.3	18	9	4	0	0	0	0	0	0	0	0	0	0
Mar.	27	0	7	2	36	0	0	12	4	72	20	2.5	41.5	63.3	18	9	4	0	0	0	0	0	0	0	0	0	0	0
Apr.	29	0	9	1	38	0	0	10	5	19	20	2.5	41.5	63.3	18	9	4	0	0	0	0	0	0	0	0	0	0	0
May	27	0	10	2	40	0	0	8	2	5	6	3.9	41.1	46.3	44.9	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6
June	20	0	10	2	40	0	0	8	2	17	0	0.7	40.9	47.0	46.9	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
July	20	0	10	2	40	0	0	8	2	0	0	0.7	40.9	47.0	46.9	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
Aug.	27	0	9	0	43	0	0	7	7	0	0	0.2	43.3	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Sept.	43	3	4	3	27	2	0	5	8	30	31	0.2	43.3	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Oct.	50	4	5	2	13	1	1	11	6	1	0	2.5	43.3	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Nov.	61	2	3	1	9	0	0	4	7	7	27	1.3	38.3	39.7	41.2	39.7	84.6	54.7	70.2	60.9	23	5	2	0	0	0	0	0
Dec.	35	0	9	0	23	0	1	15	10	40	27	3.1	35.9	38.1	38.7	37.6	91.4	66.3	80.3	79.3	17	9	5	0	0	0	0	0
Sums	424	17	16	354	4	10	117	72	13	76	.....	23.3	32.5	23.4	26.3	495.7	547.4	507.9	622.8	601.6	261	67	37	44	0	83	94	94
Means	30.6	1.1	1.1	5.32	30.4	0.9	10.7	6	.....	.....	.....	1.9	2.7	2.0	2.2	41.3	40.8	42.3	52.5	55.1	71.5	18.4	10.1	12.1	0	9.0	25.8	25.8
									Percentages.												Percentages.							

\* Inappreciable.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, corresponds with 3.59 a. m., 11.59 a. m., and 7.59 p. m., local time. Correction for instrumental error of barometer used: From 3.59 a. m., January 1, to 7.59 p. m., December 31, inclusive, +0.010 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.400; April, 0.390; May, 0.390; June, 0.390; July, 0.340; August, 0.350; September, 0.350; October, 0.360; November, 0.370; December, 0.370.

J. E. WILLIAMS,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

ROCHESTER, N. Y.

[Latitude, 43° 8' N.; longitude, 77° 42' W. Magnetic variation, 3° W. Elevation of barometer above sea-level, 621 feet. Elevation of exposed thermometer above ground, 149 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.															
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.				Total.	Miles.	Direction from—	Date.							
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.			Date.	Absolute range.													
Jan	29.448	29.425	29.444	29.439	29.887	4	28.819	29.1068	18.8	22.5	20.4	20.6	43.5	30	4.0	23	49.5	27.5	12.5	0	0	8.309	3.708	3.284	10.301	56	W.	21				
Feb	29.503	29.502	29.501	29.502	29.000	2	28.869	29.1112	21.0	26.0	23.0	23.0	57.0	16	3.0	24	54.0	30.5	15.6	0	0	8.458	3.905	3.827	11.190	48	W.	25				
Mar	29.804	29.854	29.887	29.892	29.783	8	28.851	29.1231	21.1	27.5	23.5	24.0	55.0	18	3.5	8	51.5	33.1	15.9	0	0	8.272	3.669	3.597	10.803	43	W.	12				
Apr	29.819	29.807	29.833	29.830	29.685	13	28.887	29.1748	21.2	45.7	38.5	40.8	83.5	15	18.0	1	63.5	49.5	33.3	0	0	8.553	2.839	2.621	7.803	48	W.	11				
May	29.802	29.863	29.870	29.878	29.698	17	28.917	29.1691	47.6	56.7	50.0	51.4	84.5	10	32.5	13	52.0	61.6	43.0	0	0	8.688	3.634	3.175	9.687	40	W.	31				
June	29.840	29.896	29.810	29.816	29.745	1	28.820	29.1927	60.9	72.2	62.5	65.2	84.0	6	43.5	1	40.5	74.9	55.0	0	0	1.159	1.734	1.495	4.888	48	W.	11				
July	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Aug	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sept.	29.408	29.431	29.467	29.474	29.048	16	28.600	29.1448	44.8	51.8	46.5	47.7	79.0	10	27.0	17	52.0	55.5	41.2	0	0	1.694	1.967	1.673	5.223	44	W.	30				
Oct.	29.409	29.872	29.402	29.394	29.846	27	28.754	29.1093	33.3	44.1	38.3	40.6	69.0	5	22.5	18	53.5	48.4	33.9	0	0	3.853	3.870	3.858	10.511	55	S.	26				
Nov	29.387	29.852	29.383	29.374	29.939	23	28.850	29.1099	26.8	30.6	27.7	28.2	55.5	13	1.5	23	60.0	35.0	21.4	0	0	5.009	5.112	5.300	9.511	44	W.	28				
Dec	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sums	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Station closed June 15.

Station re-opened October 15.

### REPORT OF THE CHIEF SIGNAL OFFICER.

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[illegible]

NOTE—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.57 a. m., 2.57 p. m., and 10.57 p. m., local time.

Corrections for instrumental errors of barometer used: from 6.57 a. m., January 1, to 10.57 p. m., June 15, inclusive, +0.004 inch; from 6.57 a. m., October 10, to 10.57 p. m., November 30, inclusive, +0.004 inch; from 6.57 a. m., December 1, to 6.57 a. m., December 13, inclusive, +0.022 inch; from 10.57 a. m., December 13, to 10.57 p. m., December 31, inclusive, 0.000.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.680; May, 0.660; June, 0.650; July, 0.650; August, 0.650; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

**E. W. MCGANN,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

ROSEBURG, OREG.

[Latitude, 43° 19' N.; longitude, 123° 20' W. Magnetic variation, 19° 30' E. Elevation of barometer above sea-level, 511 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 33 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.																													
Month.	Washington time.			Monthly mean.			Range.	Washington time.			Self-registering thermometers.			Washington time.				Maximum hourly velocity during month.																										
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.		Date.	Lowest.	Highest.	In.	7 a. m.	3 p. m.	11 p. m.	Mean maximum.	Mean minimum.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Date.																				
1883.																																												
Jan	29.710	29.684	29.680	29.691	30.052	8 29 153	24	29.899	33.6	40.2	38.7	37.5	38.8	30 12 0	46.8	44.8	44.8	31.1	606	636	877	2,119	20	SW.	25																			
Feb	29.618	29.625	29.601	29.615	30.038	17 28 908	13	1.130	31.4	41.0	39.1	37.2	38.7	27 0 4	50.3	47.5	47.5	29.3	441	478	811	1,730	24	S.	12																			
Mar	29.485	29.474	29.442	29.467	29.826	15 28 839	27	987	41.9	57.4	54.5	51.3	50.0	21 31.7	48.3	65.5	39.4	350	534	1,094	1,978	23	SW.	28																				
Apr	29.488	29.485	29.480	29.484	29.819	22 28 959	19	860	41.8	54.6	50.4	48.7	47.0	28 34.0	36.7	57.0	40.0	587	877	1,738	3,202	24	SW.	11																				
May	29.486	29.485	29.458	29.470	29.838	19 29 135	12	703	46.7	64.2	59.4	56.8	53.6	29 36.9	46.7	69.0	45.5	332	657	1,406	2,385	20	SW.	18																				
June	29.540	29.518	29.503	29.523	29.858	5 20 260	10	589	51.5	73.7	67.6	63.9	61.8	16 42.5	44.3	77.9	50.4	469	681	1,406	2,980	21	N.	7																				
July	29.515	29.489	29.463	29.480	29.746	19 29 219	8	527	53.7	75.5	71.7	67.0	63.3	7 9 45.1	46.8	82.4	52.1	327	616	1,711	2,654	24	SW.	8																				
Aug	29.537	29.535	29.510	29.527	29.734	17 29 321	3	413	53.9	69.0	67.0	63.3	58.6	21 39.4	46.8	73.6	48.6	374	543	1,311	2,748	14	SW.	15																				
Sept.	29.475	29.437	29.443	29.458	29.663	1 29 112	29	551	50.5	67.8	62.7	60.3	58.2	10 32.0	46.8	73.6	48.6	327	481	900	1,990	14	SW.	4																				
Oct.	29.513	29.525	29.520	29.519	29.838	9 29 054	26	784	45.6	54.2	49.9	49.9	46.5	10 32.0	33.2	58.0	43.6	354	679	906	1,490	16	SW.	27																				
Nov.	29.620	29.630	29.624	29.625	29.885	11 29 036	24	849	42.1	43.5	45.6	45.4	43.8	27 37.4	31.4	51.5	39.5	360	529	600	1,450	16	SW.	24																				
Dec	29.591	29.606	29.600	29.599	29.904	7 29 229	26	735	37.4	42.2	40.3	40.0	37.3	26 38.5	28.8	45.8	35.1	514	572	635	1,724	17	SW.	25																				
Sums	354.567	354.493	354.324	354.467	.....	.....	.....	530.1	687.3	646.5	621.4	.....	.....	.....	.....	740.5	550.7	5.041	7.303	13.042	24.286	.....	.....	.....																				
Means	29.549	29.541	29.527	29.539	30.052	*8 28 839	127	44.2	57.3	53.9	51.8	53.0	47.9	9.4	54.5	62.5	42.8	4.30	6.08	6.1	161.8	.....	.....	.....																				
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\* January.

† March.

‡ July.

§ February.

### REPORT OF THE CHIEF SIGNAL OFFICER.

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[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 3.55 a. m., 11.55 a. m., and 7.55 p. m., local time. Correction for instrumental error: From 3.55 a. m., January 1, to 7.55 p. m., December 31, inclusive, +0.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.570; February, 0.570; March, 0.560; April, 0.560; May, 0.550; June, 0.550; July, 0.540; August, 0.540; September, 0.540; October, 0.560; November, 0.570; December, 0.570.**

**J. J. NANNY**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## SACRAMENTO, CAL.

[Latitude, 38° 39' N.; longitude, 121° 39' W. Magnetic variation, 17° E. Elevation of barometer above sea-level, 46 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.				Self-registering thermometers.				Wind.			
	Washington time.					Washington time.					Washington time.				Washington time.				Maximum hourly velocity during month.			
	7 a. m.		3 p. m.		11 p. m.		7 a. m.		3 p. m.		7 a. m.		3 p. m.		7 a. m.		3 p. m.		7 a. m.		3 p. m.	
	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>	<i>I<sub>u</sub></i>	<i>I<sub>n</sub></i>
1883.																						
Jan.	30.189	30.194	30.177	30.187	30.533	30.533	30.177	30.187	30.533	30.533	30.177	30.187	30.533	30.533	30.177	30.187	30.533	30.533	30.177	30.187	30.533	30.533
Feb.	30.072	30.078	30.043	30.058	30.638	30.638	30.043	30.058	30.638	30.638	30.043	30.058	30.638	30.638	30.043	30.058	30.638	30.638	30.043	30.058	30.638	30.638
Mar.	29.932	29.954	29.921	29.938	30.163	30.163	29.921	29.938	30.163	30.163	29.921	29.938	30.163	30.163	29.921	29.938	30.163	30.163	29.921	29.938	30.163	30.163
Apr.	29.933	29.979	29.942	29.958	30.348	30.348	29.942	29.958	30.348	30.348	29.942	29.958	30.348	30.348	29.942	29.958	30.348	30.348	29.942	29.958	30.348	30.348
May	29.890	29.913	29.876	29.893	30.188	30.188	29.876	29.893	30.188	30.188	29.876	29.893	30.188	30.188	29.876	29.893	30.188	30.188	29.876	29.893	30.188	30.188
June	29.850	29.858	29.812	29.840	30.138	30.138	29.812	29.840	30.138	30.138	29.812	29.840	30.138	30.138	29.812	29.840	30.138	30.138	29.812	29.840	30.138	30.138
July	29.824	29.848	29.789	29.820	30.033	30.033	29.789	29.820	30.033	30.033	29.789	29.820	30.033	30.033	29.789	29.820	30.033	30.033	29.789	29.820	30.033	30.033
Aug.	29.849	29.883	29.830	29.854	30.024	30.024	29.830	29.854	30.024	30.024	29.830	29.854	30.024	30.024	29.830	29.854	30.024	30.024	29.830	29.854	30.024	30.024
Sept.	29.831	29.855	29.815	29.834	30.078	30.078	29.815	29.834	30.078	30.078	29.815	29.834	30.078	30.078	29.815	29.834	30.078	30.078	29.815	29.834	30.078	30.078
Oct.	29.821	29.830	29.809	29.811	30.227	30.227	29.809	29.811	30.227	30.227	29.809	29.811	30.227	30.227	29.809	29.811	30.227	30.227	29.809	29.811	30.227	30.227
Nov.	30.084	30.086	30.036	30.030	30.326	30.326	30.036	30.030	30.326	30.326	30.036	30.030	30.326	30.326	30.036	30.030	30.326	30.326	30.036	30.030	30.326	30.326
Dec.	30.092	30.102	30.091	30.090	30.410	30.410	30.091	30.090	30.410	30.410	30.091	30.090	30.410	30.410	30.091	30.090	30.410	30.410	30.091	30.090	30.410	30.410
Sums	359.441	359.660	359.321	359.446	.....	.....	359.321	359.446	.....	.....	359.321	359.446	.....	.....	359.321	359.446	.....	.....	359.321	359.446	.....	.....
Means	29.933	29.972	29.936	29.954	30.086	30.086	29.936	29.954	30.086	30.086	29.936	29.954	30.086	30.086	29.936	29.954	30.086	30.086	29.936	29.954	30.086	30.086

One 11 p. m. observation missed. One 7 a. m. observation missed. \* February. † October. ‡ July. § January 20 and February 2.

[illegible]

**NOTE.**—7 a. m., 3 p. m., and 11 p. m., correspond with 4.02 a. m., 12.02 p. m., and 8.02 p. m., local time.

NOTE.—/ a. m., 3 p. m., and 11 p. m., correspond with 4.02 a. m., 12.02 p. m., and 8.02 p. m., local time. Correction for instrumental error of barometer used: From 4.02 a. m., January 1, to 8.02 p. m., December 31, inclusive, +0.001 inch.

April, 0.080; May, 0.080; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.080; November, 0.080; December, 0.080.

**JAMES A. BARWICK,**  
*Sergeant, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SAINT LOUIS, MO.

[Latitude, 38° 39' N.; longitude, 90° 12' W. Magnetic variation, 6° 20' E. Elevation of barometer above sea-level, 563 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 101 feet.]

Month.	Barometer (corrected for the temperature and instrumental error only).										Temperature.						Wind.							
	Washington time.			Monthly mean.			Date.	Lowest.	Highest.	Washington time.			Self-registering thermometer.			Washington time.			Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.				Monthly mean.	Maximum.	Date.	Minimum.	Date.	Altogether range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Date.
1883.																								
Jan	28.557	29.537	29.559	In.	In.	In.	22/28.996	30	1.062	20.6	28.1	23.1	23.2	43.5	26—3.7	21.62	31.9	15.8	°	°	°	°	°	
Feb	28.672	29.637	29.660	24	1.160	28.9	28/29.023	34	1.104	28.9	30.4	30.5	31.3	66.7	15—0.5	5.67	39.9	22.6	2.722	2.862	2.253	8,788	43	NW.
Mar	28.477	29.439	29.459	20	1.04	28.3	28/29.228	28	1.04	28.3	30.4	30.5	31.3	66.7	15—0.5	5.67	39.9	22.6	2.722	2.862	2.253	8,788	43	NW.
Apr	28.336	29.291	29.314	20	1.04	28.3	28/29.738	22	0.966	28.5	30.5	30.6	31.3	66.7	15—0.5	5.67	39.9	22.6	2.722	2.862	2.253	8,788	43	NW.
May	28.307	29.329	29.344	20	1.04	28.3	28/29.864	24	0.749	28.5	30.5	30.6	31.3	66.7	15—0.5	5.67	39.9	22.6	2.722	2.862	2.253	8,788	43	NW.
June	28.366	29.334	29.337	20	1.04	28.3	28/29.960	10	0.639	28.7	30.6	30.7	31.3	66.7	15—0.5	5.67	39.9	22.6	2.722	2.862	2.253	8,788	43	NW.
July	28.456	29.420	29.428	20	1.04	28.3	18/29.097	12	0.576	29.6	33.5	34.2	74.2	76.1	91.9	33.2	63.2	64.0	°	°	°	°	°	
Aug	28.492	29.459	29.465	20	1.04	28.3	20/29.308	21	0.384	29.5	30.3	31.5	72.8	87.0	91.9	33.2	63.2	64.0	°	°	°	°	°	
Sept	28.494	29.429	29.448	20	1.04	28.3	20/29.180	24	0.938	29.5	30.3	31.5	72.8	87.0	91.9	33.2	63.2	64.0	°	°	°	°	°	
Oct	28.492	29.429	29.448	20	1.04	28.3	15/29.890	20	0.909	29.5	30.3	31.5	72.8	87.0	91.9	33.2	63.2	64.0	°	°	°	°	°	
Nov	28.558	29.500	29.516	20	1.04	28.3	28/29.900	21	1.301	29.4	30.3	31.5	72.8	87.0	91.9	33.2	63.2	64.0	°	°	°	°	°	
Dec	28.511	29.483	29.520	20	1.04	28.3	14/29.886	24	0.892	29.4	30.3	31.5	72.8	87.0	91.9	33.2	63.2	64.0	°	°	°	°	°	
Suma.	338.708	338.329	338.515	333.536	.....	.....	.....	.....	.....	580.4715	4.832	3.642	6	.....	.....	.....	763.0647	5	28.913	34.061	32.997	95.970	.....	.....
Means.	28.461	29.443	29.460	28.461	30.162	.....	21/29.768	22	.....	48.4	50.6	52.7	53.6	97.0	.....	.....	63.8	45.0	2.722	2.862	2.253	8,788	43	NW.

• February.

† April.

‡ August.

§ January.

Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Rainfall or melted snow.		Washington time.						Number of days—					Remarks.								
Month.		North.					South.					Number of calms.		Any 8 consecutive hours measure-ments.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.		
		North-east.	East.	South-east.	South.	West.	North-west.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.		11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.											
		Total amount.										Largest amount.		Data.																	
1883.		In.		Ft.								In.		Ft.																	
Jan.		15	5	7	12	9	5	12	27	0	0.94	0.27	15	16.9	20.4	10.1	18.8	85.6	79.0	84.6	83.1	5	11	9	16	30	0	0	0		
Feb.		17	4	10	12	5	11	11	5	29	0	5.88	1.76	2.3	30.7	27.3	27.4	89.6	80.6	87.9	86.0	9	8	11	8	21	0	0	0		
Mar.		15	13	4	8	29	16	8	7	10	0	2.29	0.76	5.6	30.1	38.4	33.9	88.5	76.5	86.5	83.8	7	13	11	13	2	18	0	0		
Apr.		13	4	8	29	16	8	7	10	0	3.31	1.61	21	22	5.0	3.5	4.7	43.0	49.9	48.5	47.8	10	12	8	9	0	0	0	0		
May		18	2	3	12	29	4	8	17	0	2.89	1.17	18	19	5.8	6.0	3.9	52.9	53.8	55.8	55.8	8	13	10	13	0	0	0	1		
June		12	1	4	20	15	4	18	16	0	5.04	1.24	15	6	4.3	3.2	5.0	62.7	64.4	64.5	63.9	7	19	4	13	0	0	0	2		
July		9	6	8	14	22	18	3	6	2	4.31	1.28	16	4	1.1	3.3	6.7	65.5	66.7	65.9	73.3	10	16	5	10	0	0	0	13		
Aug.		27	15	10	11	16	3	8	4	4	3.34	1.86	14	15	3.6	4.5	1.9	62.7	60.7	64.7	62.7	8	14	15	7	0	0	0	4		
Sept.		15	18	4	8	18	10	6	11	0	0.01	0.01	30	3	3.5	2.2	2.9	53.2	54.7	53.6	65.4	16	12	2	1	0	0	0	8		
Oct.		21	16	10	18	8	4	8	8	0	6.60	2.21	18	7.1	4.9	6.4	48.1	50.7	49.5	49.4	4	13	14	16	0	0	0	0	0		
Nov.		8	3	4	12	22	6	11	14	0	3.71	2.41	21	4.3	4.4	3.5	4.1	36.2	40.0	38.4	38.2	13	12	5	6	0	6	0	0		
Dec.		9	5	1	7	21	17	20	18	0	1.78	0.69	13	14	5.1	5.6	4.6	51.1	52.3	50.7	51.0	14	5	12	11	2	15	0	0		
Sums.		179	62	63	160	213	99	108	175	6	64.0	16	61	766	945	8	53	0	528	553	558	0	117	153	95	118	28	90	23	0	
												Percentages.										Percentages.									
Means.		15	4.8	4.5	8.4	6.19	4.9	9	15	0.6	5.1	5.5	3.8	4.8	43.9	47.0	44.2	45.7	85.0	66.3	73.7	77	0.82	1.41	0.82	0.32	7.72	4.7	6.3	0	0

Norm.—7 a. m., 8 p. m., and 11 p. m. Washington time, correspond with 6.07 a. m., 2.07 p. m., and 10.07 p. m., local time.

Correction for instrumental error of barometer used: From 6.07 a. m., January 1, to 10.07 p. m., December 31, inclusive, —0.10 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.680; April, 0.630; May, 0.610; June, 0.600; July, 0.600; August, 0.600; September, 0.610; October, 0.620; November, 0.640; December, 0.660.

J. H. WEBER,  
Bergsamt, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SAINT MICHAEL'S, PORT, ALASKA.

[Latitude, 69° 39' N.; longitude, 161° 40' W. Magnetic variation, 28° 17' E. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer (corrected for temperature and instrumental error only).										Temperature.				Wind.												
Washington time.				Monthly mean.				Range.		Washington time.				Self-registering thermometers.				Washington time.								
7 p. m.	3 p. m.	11 p. m.		Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction from—	Maximum hourly velocity during month.	
28.05	28.05	28.05	28.05	28.05	4	28.05	4	2.59	8.51	17.2	17.8	16.9	43.6	10	20	30	32.6	22.6	11.2	12.196	12.479	7,176	55	N.E.	15	
28.05	28.05	28.05	28.05	28.05	20	28.05	20	1.562	8.4	10.5	11.1	10.3	41.0	20	10	24	36	57.0	17.2	10.4	2.739	2,631	6,165	64	S.W.	91
28.12	28.12	28.12	28.12	28.12	18	28.12	18	1.045	13.9	17.4	17.6	16.4	40.0	20	8	9	67.0	23.1	10.1	7.4	2.808	2,669	8,318	64	S.W.	26
28.64	28.64	28.64	28.64	28.64	9	28.64	9	1.207	11.9	17.4	17.6	16.4	37.0	20	8	26	45.0	20.4	10.1	8.2	2.809	2,669	7,445	31	S.	21
28.731	28.731	28.731	28.731	28.731	27	28.731	27	1.002	33.4	38.2	38.7	37.1	31.7	31	22	1	29.7	43.2	40.9	30.9	1.516	1,570	7,705	30	S.	8
28.861	28.861	28.861	28.861	28.861	15	28.861	15	1.655	43.8	43.8	43.8	43.8	56.5	35	35	5	27.5	52.1	40.6	40.6	1.091	2,745	7,286	32	S.	27
28.816	28.816	28.816	28.816	28.816	13	28.816	13	0.71	48.9	52.0	54.0	51.6	60.6	37	37	12	29.5	57.3	45.2	45.2	2.457	2,598	7,476	43	S.	3
28.94	28.94	28.94	28.94	28.94	16	28.94	16	1.837	47.2	56.0	51.5	49.8	63.6	36	36	14	28.6	64.3	45.2	45.2	2.545	2,380	9,339	44	S.W.	20
28.545	28.545	28.545	28.545	28.545	9	28.545	9	1.042	43.1	46.0	45.4	44.3	44.5	1	32	21	28.3	48.8	41.1	41.1	3.112	3,316	9,726	48	S.E.	22
28.572	28.572	28.572	28.572	28.572	20	28.572	20	1.190	32.2	34.0	34.1	33.1	44.1	8	30	28	33.1	37.6	29.4	29.4	3.278	3,528	9,944	64	S.W.	23
28.792	28.792	28.792	28.792	28.792	19	28.792	19	2.185	12.2	13.7	12.3	12.3	49.5	1	17	19	33.1	16.1	5.0	5.0	4.711	4,481	13,450	64	S.E.	11
28.760	28.760	28.760	28.760	28.760	19	28.760	19	1.246	3.7	5.0	5.0	4.7	49.5	1	20	10	63.5	10.6	2.0	2.0	4.310	4,329	8,490	44	S.	30
357.497	357.520	357.843	357.443					315.9	344.6	354.4	353.8	353.2					404.5	208.7	28.5	28.5	28.5	103.109				
28.789	28.793	28.779	28.787	31.288	14				26.3	28.7	29.5	28.3	36.6	9	27.0	65		33.9	22.4	22.4	22.4	22.4	22.4			
Means										Averages.																

\$ March.

September.

January.

February.

March.

April.

May.

June.

July.

August.

September.

\$ March.

September.

January.

February.

March.

April.

May.

June.

July.

August.

September.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Rainfall or melted snow.		Washington time.								Number of days—				Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.					South.					Southwest.					West.					Northwest.					Total amount.	Any 3 consecutive hours hourly measurements.	Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	0.1 inch or more of water.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Northeast.	East.	Southeast.	South.	Northwest.	Southwest.	West.	Northwest.	North.	South.	Southwest.	West.	Northwest.	Cloudiness 7 a. m.	Cloudiness 8 p. m.	Cloudiness 11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.				Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
1883.	4	41	13	10	15	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2	0	4	2

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 1.21 a. m., 9.21 a. m., and 5.21 p. m., local time.

Correction for instrumental error of barometer used: From 1.21 a. m., January 1, to 5.21 p. m., December 31, inclusive, +.027 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.04; February, 0.04; March, 0.04; April, 0.03; May, 0.03; June, 0.03; July, 0.03; August, 0.03; September, 0.03; October, 0.03; November, 0.03; December, 0.04.

FRED. H. CLARKE,  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SAINT PAUL, MINN.

[Latitude, 44° 58' N.; longitude, 93° 3' W. Magnetic variation, 10° 45' E. Elevation of barometer above sea level, 1,801 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 61 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.								
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Mean maximum.			Mean minimum.			Washington time.			Maximum hourly velocity during month.			
	7 p. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Maximum.	Date.	Minimum.	Absolute range.	Date.	Mean maximum.	Date.	Mean minimum.	7 p. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.	Date.	
1883.																									
Jan.	29.208	29.198	29.219	29.204	29.197	29.204	29.197	29.204	29.197	29.204	30	29.128	29.198	29.204	29.128	29.198	29.204	29.128	29.198	29.204	4.751	41	SE	12	
Feb.	29.331	29.307	29.307	29.315	29.307	29.315	29.307	29.315	29.307	29.315	16	1.075	5.9	18.0	12.4	40.5	27	28.0	1.751	1.751	1.751	4.751	38	SE	10
Mar.	29.173	29.157	29.163	29.164	29.162	29.164	29.162	29.164	29.162	29.164	17	1.208	19.1	29.9	24.4	40.5	27	7.0	1.751	1.751	1.751	4.751	38	SE	18
Apr.	29.050	29.007	29.016	29.024	29.025	29.024	29.025	29.024	29.025	29.024	14	1.066	38.9	51.0	45.4	73.5	27	19.0	1.751	1.751	1.751	4.751	38	SE	13
May.	29.041	29.041	29.053	29.053	29.053	29.053	29.053	29.053	29.053	29.053	18	1.008	45.7	59.0	51.6	52.2	73.0	16	2.037	2.037	2.037	6.753	37	SE	18
June.	29.042	29.072	29.037	29.037	29.037	29.037	29.037	29.037	29.037	29.037	11	1.557	59.4	71.6	64.4	63.1	81.5	29	1.777	1.777	1.777	6.753	37	SE	18
July.	29.085	29.089	29.089	29.089	29.089	29.089	29.089	29.089	29.089	29.089	11	1.066	63.8	77.2	69.7	70.2	100.0	1	1.777	1.777	1.777	6.753	37	SE	18
Aug.	29.181	29.158	29.162	29.162	29.162	29.162	29.162	29.162	29.162	29.162	21	1.066	59.4	77.2	69.7	70.2	100.0	1	1.777	1.777	1.777	6.753	37	SE	18
Sept.	29.224	29.187	29.200	29.200	29.200	29.200	29.200	29.200	29.200	29.200	24	1.184	49.8	64.6	55.6	54.5	84.0	1	1.777	1.777	1.777	6.753	37	SE	18
Oct.	29.232	29.183	29.213	29.213	29.213	29.213	29.213	29.213	29.213	29.213	24	1.184	49.8	64.6	55.6	54.5	84.0	1	1.777	1.777	1.777	6.753	37	SE	18
Nov.	29.134	29.087	29.106	29.106	29.106	29.106	29.106	29.106	29.106	29.106	25	1.239	27.8	38.8	31.8	32.8	60.0	2	1.777	1.777	1.777	6.753	37	SE	18
Dec.	29.179	29.166	29.163	29.163	29.163	29.163	29.163	29.163	29.163	29.163	17	1.231	15.8	24.0	19.6	19.8	53.0	12	1.777	1.777	1.777	6.753	37	SE	18
Sums.	342.900	342.623	342.727	342.750	342.750	342.750	342.750	342.750	342.750	342.750	423	7.063	1,685.9	491.0	.....	618.6	381.9	16,236	24,729	21,500	62,525	.....	.....	.....	
Means.	29.156	29.136	29.144	29.146	29.146	29.146	29.146	29.146	29.146	29.146	35.3	47.9	40.5	40.9	100.0	51.6	31.8	1,833.2	2,060.5	1,768.7	.....	.....	.....	.....	

January.

July.

May.

November.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—					Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Any 3 consecutive hourly measurements.			Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.		
											Total amount.	Largest amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.
1883.										In.	In.																					
Jan	6	1	2	17	7	14	15	19	12	.64	0.21	30	4.4	5.2	4.2	4.0	0	0	0	0	0	67.0	82.7	77.8	77.8	11	12	8	31	31	0	
Feb	6	0	4	6	20	12	13	8	8	.44	0.23	23, 24	3.9	4.5	4.1	4.2	1.8	8.3	7.1	5.7	5.7	53.3	68.7	65.2	65.2	10	14	4	22	28	0	
Mar	12	2	0	8	7	9	15	27	13	.06	0.03	25	6.1	5.2	2.7	4.7	12.0	15.0	13.6	14.2	73.5	58.3	68.7	65.2	7	12	5	6	8	0		
Apr	16	1	11	16	13	4	10	14	5	4.92	1.04	21, 22	6.7	5.8	4.5	5.7	23.8	30.6	32.2	30.5	67.7	49.6	61.0	59.4	7	12	10	4	0	0		
May	17	8	5	8	12	4	8	17	14	2.12	0.82	17	6.8	6.6	4.1	5.8	39.0	37.5	40.1	38.9	77.9	47.1	65.9	63.6	6	14	11	0	0	0		
June	15	4	5	2	7	14	17	13	10	7.04	1.86	1, 2	5.5	6.2	3.3	5.0	53.4	55.8	56.4	55.2	81.7	59.8	76.0	72.3	9	15	6	16	0	0		
July	8	4	4	7	23	16	8	11	14	4.33	2.32	6	5.1	6.3	3.1	4.8	54.0	57.8	61.3	55.0	81.7	52.7	75.1	60.8	10	16	5	10	0	0		
Aug	8	4	4	7	23	16	8	11	14	4.33	2.32	6	5.1	6.3	3.1	4.8	54.0	57.8	61.3	55.0	81.7	52.7	75.1	60.8	10	16	5	10	0	0		
Sept	5	12	3	3	20	10	5	21	3	2.23	0.90	20, 21	5.0	5.3	3.9	4.7	44.7	45.5	47.6	45.9	82.8	58.4	74.9	70.4	13	9	8	11	0	1		
Oct	5	12	3	3	20	10	5	21	3	2.23	0.90	20, 21	5.0	5.3	3.9	4.7	44.7	45.5	47.6	45.9	82.8	58.4	74.9	70.4	13	9	8	11	0	1		
Nov	2	1	0	7	24	5	12	21	18	1.01	0.55	5	5.0	6.5	5.1	5.5	18.3	23.9	22.3	21.5	60.3	57.1	67.9	64.8	6	15	9	5	4	23		
Dec	8	3	1	6	13	9	7	7	19	1.59	0.84	6, 7	4.3	6.1	3.6	4.7	7.1	14.2	10.1	10.5	63.6	68.0	67.9	68.2	11	14	6	12	19	20		
Sums	109	32	42	188	177	111	122	217	147	26.70	.....	.....	64.9	70.6	47.1	60.9	345.7	376.7	380.2	367.1	685.8	890.1	836.2	836.2	108	161	96	114	82	156	4	
Means	10.02	9.3	9.12	6.12	6.12	2.10	1.11	1.19	8.13	4	.....	.....	5.4	5.9	3.9	5.1	23.8	31.3	31.7	30.6	77.7	57.2	71.7	68.9	29.6	44.1	20.3	31.2	23.5	42.7	1.1	
	Percentages.									Percentages.										Percentages.					Percentages.							

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.56 a. m., 1.56 p. m., and 9.56 p. m., local time.

Correction for instrumental error of barometer used: From 5.56 a. m., January 1, to 9.56 p. m., December 31, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.380; March, 0.910; April 0.880; May, 0.840; June, 0.840; July, 0.830; August, 0.830; September, 0.850; October, 0.870; November, 0.910; December, 0.950.

P. F. LYONS,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SAINT VINCENT, MINN.

[Latitude, 49° 58' N.; longitude, 97° 14' W. Magnetic variation, 1° 17' E. Elevation of barometer above sea-level, 804 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 14 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.			Monthly mean.			Highest.				Washington time.			Self-registering thermometers.			Washington time.			Mean minimum.			Mean maximum.			Washington time.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7 p. m.	8 p. m.	11 p. m.	In.	Out.	In.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	8 p. m. to 11 p. m.	3 p. m. to 8 p. m.	Total.	Miles.	Direction	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Any 3 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Rain.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.40 a. m., 1.40 p. m., and 9.40 p. m., local time. Correction for instrumental error of barometer used: From 5.40 a. m., January 1, to 9.40 p. m., December 31, inclusive, +0.001 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.980; February, 0.979; March, 0.940; April, 0.910; May, 0.880; June, 0.850; July, 0.840; August, 0.850; September, 0.870; October, 0.900; November, 0.930; December, 0.990.

C. B. DILLEY  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

## SALT LAKE CITY, UTAH.

[Latitude, 40° 40' N.; longitude, 111° 54' W. Magnetic variation, 17° E. Elevation of barometer above sea-level, 4,248 feet. Elevation of exposed thermometer above ground, 52 feet. Elevation of rain-gauge above ground, 78 feet.]

Barometer (corrected for temperature and instru- mental error only).										Temperature.					Wind.										
Month.	Washington time.			Monthly mean.			Higheest.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Washington time.			Total.	Miles.	Maximum hourly velocity during month.			
	7 a. m.	8 p. m.	11 p. m.	In.	Un.	Date.					Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 8 p. m.	8 p. m. to 11 p. m.						
1883.																									
Jan.	25.733	25.715	25.717	25.722	25.177	8.25	228	17	0.951	21.2	29.3	24.1	24.9	47.0	25	20.67	32.0	16.8	612	788	933	2,333	28	N.W.	7, 17
Feb.	25.714	25.719	25.739	25.724	25.874	17.25	228	14	1.169	19.9	29.8	23.0	24.2	50.0	14	5.60	32.4	15.8	897	899	1,144	2,590	37	S.E.	14
Mar.	25.638	25.636	25.617	25.628	25.021	2.25	228	29	0.793	40.4	51.0	46.5	47.0	66.0	26	30.01	54.2	37.7	963	1,292	2,041	4,136	23	N.W.	18
Apr.	25.511	25.505	25.502	25.500	25.010	14.24	979	20	1.031	39.6	51.2	45.5	45.8	72.0	30	13.44	55.2	36.0	963	1,785	2,176	4,914	84	S.E.	24
May	25.594	25.598	25.571	25.595	25.901	20.25	241	17	0.720	50.4	64.1	58.6	57.0	83.0	31	23.0	67.7	45.7	667	1,124	1,559	3,350	82	(1)	12
June.	25.622	25.623	25.600	25.615	25.872	6.55	309	10	0.563	62.7	78.8	69.9	70.5	100.0	29	47.0	82.8	57.8	1,108	1,175	1,845	4,168	28	N.W.	14
July.	25.668	25.671	25.634	25.657	25.804	24.25	489	12	0.315	68.1	84.0	75.5	75.9	98.0	1	55.0	87.8	61.4	848	695	1,693	3,224	30	N.E.	9
Aug.	25.694	25.697	25.690	25.687	25.864	19.25	466	12	0.398	68.8	84.1	78.2	76.4	94.0	13	61.5	88.7	66.8	934	764	1,914	3,312	24	N.E.	20
Sept.	25.700	25.692	25.674	25.699	25.963	20.25	405	30	0.558	62.0	77.1	68.8	69.3	99.0	3	44.5	79.8	60.1	1,057	1,028	1,708	3,703	36	N.W.	7
Oct.	25.600	25.603	25.609	25.608	25.823	31.25	156	27	0.737	41.8	51.9	45.5	46.1	66.0	6	27.6	54.3	38.7	1,070	1,170	1,504	3,746	28	N.W.	28
Nov.	25.717	25.708	25.716	25.714	25.186	29.25	141	24	1.045	34.6	44.6	37.7	39.0	64.2	2	17.3	47.1	31.2	816	890	1,359	3,106	32	N.E.	24
Dec.	25.736	25.742	25.748	25.742	25.220	31.25	289	28	0.921	28.4	37.4	32.0	32.0	53.0	27	5.4	39.5	25.4	908	890	1,177	2,684	26	S.	25
Sums.	307.911	307.910	307.796	307.807	880	.....	.....	.....	538.4	697.3	801.0	609.0	.....	.....	.....	720.0	497.5	510	12,546	18,883	41,716	.....	.....	.....	.....
Means.	25.661	25.659	25.650	25.657	25.274	17.24	979	20	.....	44.9	57.3	50.1	50.8	100.0	129	20.0	60.0	41.6	857.31	945.61	1,578.6	.....	.....	.....	.....

§ January.

‡ June.

† April.

\* February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—							Remarks.		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Partly.	Cloudy.	.01 inch or more of water.	Maximum below 32°.		Minimum below 32°.	Maximum above 90°.
											Date.	Largest amount.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								
1883.																														
Jan.....	4	4	1	16	3	5	6	11	45	1.470.42	In.	29	20	11.7	50.5	56.9	54.4	56.9	6	15	10	9	13	27	0					
Feb.....	1	3	2	10	1	1	2	25	45	0.720.37	In.	17	8	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Mar.....	7	6	3	10	3	1	2	25	29	1.750.86	In.	29	3	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Apr.....	4	4	5	19	3	1	2	28	25	2.920.75	In.	22	6	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
May.....	8	3	2	12	0	1	3	22	37	0.980.77	In.	12	3	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
June.....	16	6	5	11	2	1	3	33	12	0.830.29	In.	14	15	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
July.....	25	6	5	11	2	1	3	33	12	0.830.29	In.	14	15	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Aug.....	7	11	4	14	5	1	4	9	29	0.620.35	In.	31	8	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Sept.....	5	6	8	15	5	4	1	17	22	1.130.11	In.	1	2	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Oct.....	10	5	7	23	5	3	3	24	15	2.240.60	In.	25	20	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Nov.....	1	6	8	16	12	7	7	20	36	1.780.62	In.	22	5	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Dec.....	6	0	7	10	0	1	7	20	36	1.200.61	In.	22	5	10.2	58.8	52.6	53.9	55.7	14	10	4	4	13	27	0					
Sums.....	89	58	52	161	43	30	49	252	353	14.24	In.	46	62	144.861	0.331	337.6	342.2349	7.625	7.695	7.554	0.558	3	150	140	24					
Means	Percentages.																													
	8.25 3.4 3.4 8.4 0.2 0.2 0.2 2.32 3.5 41.3 46.2 46.5 41.4 38.7 15.9 20.0 7.7 28.0 6.6																													
	First frost of season Nov. 9.																													

Three 7 a. m., three 3 p. m., two 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.40 a. m., 12.40 p. m., and 8.40 p. m., local time. Correction for instrumental error of barometer used: From 4.40 a. m., January 1, to 8.40 p. m., December 31, inclusive, +0.013 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.570; February, 4.560; March, 4.520; April, 4.570; May, 4.520; June, 4.520; July, 4.520; August, 4.520; September, 4.520; October, 4.490; November, 4.570; December, 4.540.

JOHN CRAIG,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883*—Continued.

SAN DIEGO, CAL.

[Latitude, 32° 43' N.; longitude, 117° 10' W. Magnetic variation, 14° 30' E. Elevation of barometer above sea-level, 67 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 30 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.									
Month.	Washington time.			Monthly mean.			Date.	Lowest.	Range.	Washington time.			Monthly mean.	Self-registering thermometer.			Mean maximum.	Mean minimum.	Washington time.			Total.	Miles.	Maximum hourly velocity during month.	
	7 a. m.	3 p. m.	11 p. m.	Date.	Maximum.	Minimum.				Date.	Absolute range.	7 a. m. to 11 p. m.		3 p. m. to 7 p. m.	11 p. m. to 3 p. m.	11 p. m. to 7 a. m.			7 p. m. to 11 p. m.	3 p. m. to 11 p. m.	Direction from—			Date.	
1883.																									
Jan.	30.058	30.054	30.062	30.058	30.251	30.062	2	794	47.9	60.7	51.6	53.4	76.0	29.32	4	21.43	62.7	1.070	1.246	1.841	4,197	24	SE.	3	3
Feb.	30.014	30.027	30.025	30.023	30.458	30.025	1	688	48.0	60.6	53.0	53.9	82.6	27.35	8	17.46	63.5	1.239	1.275	2.083	4,699	27	NE.	18	18
Mar.	29.972	29.987	29.986	29.982	30.123	29.986	29	281	54.5	61.3	54.4	57.4	71.2	1.48	0	25.2	62.6	1.949	1.275	2.064	4,288	19	NW.	19	19
Apr.	29.931	29.957	29.950	29.946	30.247	29.950	23	540	53.8	63.7	56.1	57.4	84.8	16.42	1	14.42	64.9	1.830	1.963	2.515	5,798	22	W.	13	13
May	29.992	29.997	29.998	29.918	30.083	29.998	21	268	55.8	68.0	60.0	60.6	89.0	20.45	4	3.43	68.0	1.011	1.675	2.400	6,098	21	S.	6	6
June	29.812	29.868	29.863	29.854	30.030	29.863	26	325	62.2	72.4	65.2	66.6	84.3	27.56	2	4.28	74.2	1.913	1.677	2.302	4,792	19	NW.	15	15
July	29.876	29.900	29.895	29.888	30.004	29.895	29	225	65.2	74.0	66.9	68.9	80.0	35.00	0	20.31	75.5	900	1.671	2.402	4,973	20	S.	8	8
Aug.	29.876	29.897	29.891	29.888	30.072	29.891	22	169	65.0	74.5	67.8	68.8	84.0	29.59	0	23.24	75.9	680	1.899	2.029	4,108	18	NW.	23	23
Sept.	29.829	29.837	29.839	29.835	30.089	29.839	22	330	64.9	75.9	68.3	69.7	101.0	22.59	0	28.42	78.2	711	1.872	2.022	4,108	23	NW.	6	6
Oct.	29.905	29.907	29.916	29.909	30.088	29.916	8	447	67.1	80.5	72.4	72.4	80.5	23.47	8	8.32	69.0	1,004	1.494	2.093	4,901	25	NW.	22	22
Nov.	29.968	29.962	29.978	29.969	30.116	29.978	19	274	62.8	66.4	56.9	58.7	82.2	12.43	0	25.1	67.7	857	1.033	1.616	3,526	19	NE.	13	13
Dec.	29.998	29.990	29.911	29.900	30.208	29.911	4	511	62.0	64.5	56.1	57.5	78.2	16.42	0	30.3	65.7	1,054	1,253	1,737	4,094	26	NE.	15	15
Sums.	350.174	350.313	350.333	350.306	350.309	794.5	.....	.....	677.7	807.6	718.1	794.5	.....	.....	.....	328.9	682.6	11,708	17,855	25,004	54,197	.....	.....	.....	.....
Means.	29.931	29.945	29.944	29.930	30.045	61.2	.....	.....	54.5	67.3	59.8	61.2	101.0	0.123	32.4	121	.....	.....	.....	.....	.....	.....	.....	.....	.....

One 7 a. m. observation missed.

Two 7 a. m. observations missed.

February.

September.

January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Cloudiness (in tenths.)			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Minimum below 32°.	Maximum below 32°.	Maximum above 30°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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One 7 a. m. observation missed.

Two 7 a. m. observations missed.

NOTE.—7 a. m., 3 p. m., 11 p. m., Washington time, correspond with 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time. Correction for instrumental error of barometer used: From 4.20 a. m., January 1, to 8.20 p. m., December 31, inclusive, —0.020 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.07; February, 0.07; March, 0.07; April, 0.07; May, 0.07; June, 0.07; July, 0.07; August, 0.07; September, 0.07; October, 0.07; November, 0.07; December, 0.07.

F. R. DAY,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## SANDUSKY, OHIO.

[Latitude, 41° 24' N.; longitude, 82° 40' W. Magnetic variation, 49° E. Elevation of barometer above sea-level, 630 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 64 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 p. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.		Mean minimum.	11 p. m.	7 a. m.	3 p. m.	8 p. m.	Total.	Miles.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Station reopened July 30.

Station closed March 31.

### REPORT OF THE CHIEF SIGNAL OFFICER.

643

[illegible]

**1 Station closed March 31.**

**<sup>2</sup>Station re-opened July 20.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time. Corrections for instrumental errors of barometer used: From 6.38 a. m., January 1, to 10.38 p. m., March 31, inclusive,  $-0.006$ ; from 0.38 a. m., July 20, to 10.38 p. m., December 31, inclusive,  $-0.011$ .

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.700; May, 0.670; June, 0.670; July, 0.660; August, 0.660; September, 0.680; October, 0.670; November, 0.720; December, 0.780.

**B. F. HOUGH,**  
*Sergeant, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SANDY HOOK, N. J.

[Latitude, 40° 28' N.; longitude, 74° W.; magnetic variation, 7° W. Elevation of barometer above sea-level, 28 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).						Temperature.						Wind.					
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Washington time.			Maximum hourly velocity during month.		
	7 a. m.	9 p. m.	11 p. m.	In.	Th.	In.	Range.	Date.	Lowest.	Th.	Date.	Highest.	Date.	Lowest.	Th.	Date.	Lowest.	Th.
1883.																		
Jan.	30.183	30.145	30.170	30.166	30.619	24.28	56.9	10.1	110	7.1	135	30.7	35.3	31.8	32.6	38.0	23.0	8.925
Feb.	30.244	30.221	30.250	30.238	30.759	2.25	60.4	7.1	135	30.7	35.3	31.8	32.6	31.8	32.6	38.0	23.0	8.925
Mar.	30.278	30.267	30.293	30.283	30.468	5.8	25.2	10.1	222	30.8	35.3	31.8	32.6	31.8	32.6	38.0	23.0	8.925
Apr.	30.006	30.004	30.008	30.002	30.453	14.29	60.0	5.8	53.3	43.4	50.8	45.0	53.4	43.4	50.8	45.0	53.4	3.023
May	30.064	30.028	30.054	30.043	30.379	1.35	47.4	22.1	90.5	55.5	63.7	58.5	68.0	58.5	63.7	58.5	68.0	3.895
June	30.078	30.054	30.067	30.066	30.474	2.28	57.5	11.1	89.9	67.2	76.2	70.3	80.0	70.3	80.0	70.3	80.0	2.815
July	30.071	30.033	30.061	30.055	30.220	21.28	69.7	15.1	65.3	71.8	80.7	72.5	80.7	72.5	80.7	72.5	80.7	3.438
Aug.	30.066	30.089	30.090	30.083	30.129	15.23	65.5	2.624	62.4	67.8	78.4	70.4	78.4	70.4	78.4	70.4	78.4	3.246
Sept.	30.079	30.038	30.054	30.058	30.427	10.29	49.8	24.1	93.9	60.9	68.7	62.2	68.7	62.2	68.7	62.2	68.7	3.863
Oct.	30.165	30.116	30.157	30.148	30.636	17.25	38.1	29.1	25.5	52.4	55.4	43.4	55.4	43.4	55.4	43.4	55.4	4.189
Nov.	30.151	30.104	30.131	30.129	30.591	17.25	60.1	11.1	90.0	43.4	44.2	45.4	44.2	45.4	44.2	45.4	44.2	3.690
Dec.	30.104	30.068	30.097	30.080	30.675	23.25	40.1	27.1	27.4	33.2	37.6	38.4	37.6	38.4	37.6	38.4	37.6	3.941
Sums.	300.859	300.535	300.734	300.649	300.619	232.25	609.7	300.619	300.619	300.619	300.619	300.619	300.619	300.619	300.619	300.619	300.619	43.176
Average.	30.072	30.029	30.061	30.064	30.759	23.24	61.0	30.064	30.759	30.064	30.759	30.064	30.759	30.064	30.759	30.064	30.759	43.176
Means.	30.072	30.029	30.061	30.064	30.759	23.24	61.0	30.064	30.759	30.064	30.759	30.064	30.759	30.064	30.759	30.064	30.759	43.176

† February.

‡ July.

§ March.

|| January.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—					Remarks.						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 30°.			
												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.	
																																Any 3 consecutive hours hourly measurements.
1883.																																
Jan.....	14	21	6	4	3	16	11	18	0	3.35	0.84	20.21	6.4	7.4	5.5	6.4	2.2	24.5	23.7	23.5	82.2	78.2	84.5	81.6	7	10	14	28	0			
Feb.....	7	4	10	8	5	13	16	26	0	4.22	1.23	6.7	4.8	6.0	4.2	3.9	25.0	24.9	24.9	70.3	77.9	82.2	79.8	7	14	17	23	0				
Mar.....	8	5	4	10	5	13	18	30	0	1.45	0.60	30	6.1	6.0	3.8	5.4	23.8	29.1	29.7	75.0	70.3	82.2	79.8	11	15	5	21	0				
Apr.....	14	13	7	13	10	10	9	14	0	5.79	1.69	16.17	3.6	4.9	4.4	5.1	37.0	37.8	37.6	75.4	73.4	75.4	73.4	6	19	5	0	0				
May.....	10	7	11	18	14	10	11	12	0	4.66	3.15	21.22	3.6	4.9	4.4	5.1	48.9	49.6	49.5	79.6	82.2	78.9	73.8	11	13	7	0	0				
June.....	3	3	8	19	15	19	11	0	0	4.94	2.06	18.19	4.1	4.2	4.3	4.1	61.8	62.7	61.8	83.1	83.1	82.6	77.1	11	14	5	0	0				
July.....	4	7	4	10	15	22	12	19	0	2.30	0.52	8.9	3.5	5.6	3.1	4.2	63.9	63.0	64.1	83.8	77.3	82.6	77.4	12	14	5	0	0				
Aug.....	5	15	13	9	7	12	26	6	0	3.44	2.19	4.0	4.8	2.2	3.7	5.1	50.8	60.6	61.1	80.5	76.3	72.9	68.5	13	14	4	0	0				
Sept.....	6	13	14	15	10	7	15	0	4	6.31	1.99	12.13	5.3	5.3	4.2	5.1	53.4	56.0	55.2	74.5	78.0	83.7	78.6	8	12	7	0	0			First light frost	
Oct.....	9	19	25	7	14	5	6	7	1	5.29	2.69	23.24	4.9	4.9	3.1	4.4	45.3	46.1	45.2	74.5	63.7	74.5	74.1	12	12	7	0	0			October 17.	
Nov.....	9	4	7	1	11	15	20	23	0	1.54	0.96	26.27	4.8	4.9	2.5	4.1	38.4	38.4	38.5	76.9	68.0	77.5	74.1	13	18	5	9	0			First heavy frost	
Dec.....	10	13	2	1	4	17	20	26	0	2.57	0.72	24	5.3	5.7	5.3	5.4	26.4	28.0	23.6	76.0	68.9	76.3	73.7	7	13	11	13	6			November 3.	
Sums ..	99	124	111	115	114	159	165	207	144.09	59.06	145.35	4.7	4.9	3.8	4.7	42.0	43.7	43.8	78.8	66.5	77.9	74	232	144	723	593	61.4					
Means	Percentages.								Percentages.																							
	9.011	310	110	510	514	515	1113	90.1				4.9	5.3	3.8	4.7	42.0	43.7	43.8	78.8	66.5	77.9	74	232	144	723	593	61.4					

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7.12 a. m., 3.12 p. m., and 11.12 p. m. local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 December 31, inclusive, +0.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

V. P. CHAPPEL,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SAFORD, FLA.

[Latitude, 28° 49' N.; longitude, 81° 29' W. Magnetic variation, 3° E. Elevation of barometer above sea-level, 50 (B) feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 47 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.								
Month.	Washington time.			Monthly mean.			Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Total.	Miles.	Direction from—	Maximum hourly velocity during month.
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.						7 a. m.	3 p. m.	11 p. m.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.				
1883.																								
Jan.	29.943	29.874	29.956	29.924	30.100	29.29.088	28.414	58.1	74.7	63.3	65.3	98.0	31.43.0	28.88.0				228	374	320	922	24	SW.	81
Feb.	29.960	29.921	29.975	29.955	30.196	29.29.043	28.553	67.4	79.4	68.6	71.8	90.3	21.53.4	17.08.9				1,078	1,970	1,861	4,909	27	NW.	24
Mar.	29.966	29.943	29.980	29.973	30.154	29.29.046	28.608	70.8	81.5	69.9	74.1	103.0	14.51.0	23.42.0				1,815	1,598	1,602	4,105	25	SW.	28
Apr.	29.966	29.963	29.999	29.989	30.128	29.29.038	28.288	80.0	85.4	76.1	80.5	108.0	21.71.0	8.57.0				737	1,454	1,804	3,435	22	SW.	28
May.	30.004	29.963	29.999	29.989	30.128	29.29.038	28.288	80.0	85.4	76.1	80.5	108.0	21.71.0	8.57.0				748	1,365	1,770	3,435	24	NW.	29
June.	30.004	29.963	29.999	29.989	30.128	29.29.038	28.288	80.0	85.4	76.1	80.5	108.0	21.71.0	8.57.0				653	1,375	1,870	3,641	27	N.E.	17
July.	29.976	29.931	29.979	29.962	30.138	29.29.075	29.373	78.2	87.2	77.3	80.9	96.9	3.69.0	30.27.9				1,028	1,760	1,777	4,585	28	N.E.	9
Aug.	29.953	29.906	29.949	29.936	30.180	27.29.737	21.403	73.7	83.3	75.4	77.5	91.0	13.66.5	11.24.5				1,183	1,968	1,879	5,030	24	N.E.	16
Sept.	29.990	29.943	29.986	29.973	30.136	6.29.774	12.362	71.7	80.6	73.6	75.3	91.8	7.62.0	11.29.8				1,634	2,280	2,197	6,091	30	N.E.	17
Oct.	30.065	30.041	30.080	30.069	30.208	16.29.897	25.371	63.6	73.0	65.4	67.8	82.2	22.50.5	8.31.8				971	1,971	1,817	3,696	24	NW.	18
Nov.	30.132	30.064	30.107	30.098	30.231	20.29.910	14.821	55.4	71.7	60.5	62.5	80.5	24.36.0	16.44.5										25
Dec.																								15
Sums.																		Averages.						
Means.																								

Six days only.

E.—Elevation determined by barometer.

Month.	Winds at 7 a. m., 9 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.												Number of days—					Remarks.				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.		Maximum above 32°.			
										Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.									3 p. m.	11 p. m.	Mean.
1883.																																
Jan.	1	10	0	0	1	5	1	0	1	0.50	0.50	31	4.7	4.0	3.7	4.1	54.5	56.2	56.7	55.8	88.2	83.3	79.0	73.5	8	1	0	0				
Feb.	1	10	0	0	1	5	1	0	1	0.50	0.50	31	4.7	4.0	3.7	4.1	54.5	56.2	56.7	55.8	88.2	83.3	79.0	73.5	8	1	0	0				
Mar.	6	24	8	13	9	18	10	5	6	2.41	3.35	1	5.0	5.8	3.2	4.7	64.8	60.5	62.9	62.7	81.8	80.3	78.6	70.7	9	15	7	8				
Apr.	0	16	7	14	13	20	11	1	8	3.57	2.82	15	16	15	16	71.8	72.3	72.7	72.3	82.9	83.5	82.0	78.7	2	18	10	22					
May	2	9	6	17	14	22	3	9	11	3.14	2.15	18	19	2.7	6.6	74.2	71.4	72.5	72.0	82.7	83.7	82.0	78.7	8	20	8	10					
June	8	23	4	24	6	12	4	7	10	6.74	1.79	25	3	7.6	3.6	4.8	74.8	69.3	72.2	72.1	80.7	80.7	84.6	77.1	4	24	8	18				
July	7	29	7	9	2	7	5	8	6	3.43	0.68	13	5	6.9	4.3	5.5	69.9	68.6	70.2	69.6	83.8	82.5	84.4	78.4	7	14	9	15				
Aug.	4	53	4	6	2	10	3	8	3	3.88	1.56	18	5	6.8	5.1	5.7	69.9	68.6	70.2	69.6	83.8	81.4	87.5	84.7	8	14	14	14				
Sept.	12	38	7	10	0	2	1	16	4	0.35	0.10	13	14	3.6	5.7	8.0	4.1	59.3	60.1	59.8	59.7	86.2	85.1	83.0	78.1	12	12	6	7			
Oct.	7	20	4	7	6	23	2	13	13	0.15	0.07	8	1	4.5	1.7	2.6	51.9	55.2	55.6	54.2	88.5	87.8	84.4	76.7	18	11	2	0				
Nov.																																
Dec.																																
Sums																																
Means																																

Six days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.43 a. m., 2.43 p. m., and 10.43 p. m., local time.

Correction for instrumental error of barometer used: From 0.43 a. m., March 25, to 10.43 p. m., December 31, inclusive, +0.014 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: March, 0.060; April, 0.060; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.060; November, 0.060; December, 0.060.

JNO. B. MARRURY  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## SAN FRANCISCO, CAL.

[Latitude, 37° 49' N.; longitude, 122° 26' W. Magnetic variation, 1° 45' E. Elevation of barometer above sea-level, 60 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 75 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.												
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Washington time.			Total.	Miles.	Direction from—	Date.						
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.					Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.		
1883.	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>					
Jan. 1	30.175	30.194	30.173	30.181	30.500	29.977	30.677	1.623	44.2	48.0	47.4	46.5	59.5	31.38.0	20.23.5	51.4	42.6	1.549	1.786	1.972	5.307	33	N.	19				
Feb. 2	30.065	30.090	30.059	30.071	30.607	29.977	30.607	1.634	44.4	50.5	48.7	47.9	70.5	27.35.0	3.4	53.5	54.3	1.500	1.611	2.022	5.133	31	W.	1				
Mar. 3	29.965	29.997	29.969	29.977	30.223	29.977	30.223	2.259	50.3	56.0	52.6	53.0	73.5	2.344.5	8.32.0	58.3	49.3	1.771	1.686	3.098	6.558	32	S.	27				
Apr. 4	29.965	29.996	29.969	29.977	30.347	29.977	30.347	2.373	49.2	56.1	51.9	52.4	63.0	2.154.3	12.13.20.0	58.3	48.3	2.290	2.120	3.858	8.268	32	W.	3				
May 5	29.922	29.956	29.930	29.939	30.227	29.930	30.227	2.293	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	26				
June 6	29.907	29.940	29.902	29.916	30.175	29.902	30.175	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	20				
July 7	29.907	29.942	29.898	29.910	30.097	29.898	30.097	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	19				
Aug. 8	29.925	29.960	29.921	29.935	30.090	29.921	30.090	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	10				
Sept. 9	29.870	29.905	29.882	29.890	30.042	29.870	30.042	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	24				
Oct. 10	29.940	29.981	29.934	29.945	30.216	29.934	30.216	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	13				
Nov. 11	30.065	30.084	30.060	30.070	30.305	30.060	30.305	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	28				
Dec. 12	30.080	30.096	30.087	30.093	30.308	30.087	30.308	2.269	52.6	61.6	56.3	56.8	86.6	2.547.5	2.38.5	64.0	51.9	2.167	2.120	3.858	8.268	32	W.	27				
Sums...	353,825	360,151	353,814	359,931	.....	.....	.....	617,070	3,050,905	1.617	700.0	805.0	750.0	.....	.....	730.0	804.0	.....	21,309	21,887	38,199	81,480	.....	.....	.....			
Means...	29.985	30.013	29.984	29.994	30.607	29.984	30.607	1.617	700.0	805.0	750.0	750.0	.....	.....	.....	730.0	804.0	.....	21,309	21,887	38,199	81,480	.....	.....	.....			
	Averages.										.....			.....			.....			.....			.....			.....		
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March.  
1 day.

By dial  
February.

One 3 p. m. observation missed.  
80 miles lost by self-register.

Two 7 a. m. observations missed.  
One 7 a. m. observation missed.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Total amount.			Any 3 consecutive hours exceeding amount.			Clearness (in tenths).			Dew-point.				Relative humidity (per cent.).			Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
											7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.		7 a. m.	8 p. m.	11 p. m.								Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Two 7 a. m. observations missed.

One 7 a. m. observation missed.

One 3 p. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 3.58 a. m., 11.58 a. m., and 7.58 p. m., local time.

Correction for instrumental error of barometer used: From 3.58 a. m., January 1, to 7.58 p. m., December 31, inclusive, +0.089 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

NELSON GOROM.

Sergeant, Signal Corps, U. S. A.

**APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.***

**SANTE FE, N. MEX.**

[Latitude, 28° 41' N.; longitude, 105° 57' W. Magnetic variation, 13° 15' E. Elevation of barometer above sea-level, 7,106 feet. Elevation of exposed thermometer above ground, 63 feet. Elevation of rain-gauge above ground, 68 feet.]

[illegible]

Station closed June 15.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.								Number of days—					Remarks.					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Total amount.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	
	30	18	3	10	9	11	5	4		In.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.						
1893.																												
Jan.....	30	18	3	10	9	11	5	4	30.42	In.	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	16	11	4	8	31	0
Feb.....	11	12	7	9	20	12	6	7	0.96	0.48	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	17	17	4	9	20	0
Mar.....	15	15	14	8	4	13	16	6	30.40	0.14	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	10	16	9	0	10	0
Apr.....	9	8	19	17	9	13	14	10	20.11	0.07	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	13	13	3	2	10	0	
May.....	3	5	17	13	17	12	10	8	20.87	0.48	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	17	8	8	4	0	0
June.....	3	5	5	7	5	11	6	1	2.8 (*)	(*)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	10	5	0	0	1	0	0
July.....																												
Aug.....																												
Sept.....																												
Oct.....																												
Nov.....																												
Dec.....																												
Sums.....																												
Means.....																												

<sup>1</sup> Station closed June 18.

<sup>2</sup> Inappreciable.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 5.04 a. m., 2.04 p. m., and 9.04 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 7.080; February, 7.080; March, 6.980; April, 6.780; May, 6.610; June, 6.510.

H. U. JONES,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

SAVANNAH, GA.

[Latitude, 32° 5' N.; longitude, 81° 5' W. Magnetic variation, 20 1/2° E. Elevation of barometer above sea-level, 87 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 56 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.								Wind.											
	Washington time.			Monthly mean.			Date.				Self-registering thermometers.				Mean maximum.				Mean minimum.				Washington time.				Maximum hourly velocity during month.			
	7 a. m.	3 p. m.	11 p. m.	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	Date.	Lowest.	Highest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	8 p. m.	11 p. m.	3 p. m.	Total.	Direction.	Miles.	Date.
1883.	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .	I <sub>h</sub> .
Jan.	30.120	30.075	30.117	30.104	30.611	23.23	47.9	9	1.322	50.1	59.0	53.4	54.2	74.5	8	27.0	12	47.5	61.4	46.7	1.438	1.063	1.040	4.756	28	W.	9			
Feb.	30.215	30.166	30.213	30.196	30.434	27.23	46.5	7	1.239	55.1	66.7	58.4	60.1	86.0	18	39.0	20	41.0	68.2	52.2	1.852	1.732	1.569	4.703	26	N.	18			
Mar.	30.008	29.882	29.970	29.970	30.380	1.22	50.0	20	1.269	51.2	63.7	54.3	57.1	86.0	30	40.0	9	40.0	66.5	49.3	1.742	2.303	2.085	6.130	28	NW.	25			
Apr.	30.054	29.913	29.940	29.938	30.202	4.20	57.6	28	1.686	63.8	72.8	66.4	67.7	85.0	24	40.0	8	38.0	74.9	60.9	1.709	2.453	2.164	6.306	38	NW.	17			
May	30.069	29.913	29.944	29.943	30.104	18.20	45.8	21	1.706	68.3	72.6	70.2	72.7	84.0	15	51.0	23	43.0	80.4	61.6	1.577	2.125	2.061	5.563	38	NW.	11			
June	30.073	29.929	29.960	29.964	30.171	4.32	71.5	26	1.456	78.3	86.9	78.4	81.2	97.0	19	65.0	2	52.0	88.4	73.8	1.169	1.937	1.861	4.967	24	NE.	14			
July	30.012	29.907	29.997	29.992	30.259	22.22	75.8	13	1.501	81.1	90.2	81.8	84.4	98.5	17	72.0	28	37.5	92.1	77.3	1.219	1.776	1.821	4.916	21	NW.	25			
Aug.	30.009	29.922	29.961	29.951	30.124	14.22	73.1	29	1.392	77.0	86.6	78.7	80.8	95.0	8	65.5	31	28.5	88.0	74.0	1.090	1.557	1.532	4.180	23	E.	20			
Sept.	30.071	29.922	29.961	29.950	30.176	17.22	73.1	29	1.445	70.4	80.9	73.2	74.8	90.0	30	51.0	10	29.0	82.1	68.1	1.147	1.831	1.866	4.634	30	NW.	10			
Oct.	30.028	29.978	30.014	30.003	30.283	17.22	73.1	29	1.395	65.2	75.1	68.0	70.0	81.5	3	58.2	31	35.8	77.8	62.4	1.041	1.518	1.732	4.111	24	NW.	17			
Nov.	30.137	30.081	30.124	30.114	30.480	19.22	59.6	14	1.481	58.3	67.4	68.0	69.6	81.0	11	50.0	17	51.0	68.5	57.0	1.041	1.864	1.569	4.723	19	NW.	12			
Dec.	30.102	30.046	30.065	30.061	30.239	22.22	73.0	14	1.529	50.8	64.5	55.9	57.1	74.7	9	23.0	16	46.7	65.2	49.2	1.570	1.668	1.878	4.816	20	W.	27			
Sums.	300.456	300.844	300.290	300.199	300.740	765.6	803.4	799.4	810.7	765.6	803.4	799.4	810.7	912.8	780.5	15,003	32,897	31,105	60,005	Averages.	60.9	1,533.61	908.11	768.8	.....	.....	.....	.....	.....	.....
Means.	30.068	29.967	30.025	30.017	30.611	7.22	20.455	7.21	.....	63.8	74.4	66.6	68.3	98.5	115.17	27.0	12	47.5	61.4	46.7	1.438	1.063	1.040	4.756	28	W.	9			

One 7 a. m. and one 11 p. m. observation missed. \* One 11 p. m. observation missed. \* January. † May. ‡ July.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Fair.	Cloudy.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
											Date.	Longest amount.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.						
1883.																														
Jan.....	13	5	15	7	14	9	10	19	1	7.34	3.48	18	5.7	7.1	5.7	6.2	42.3	46.8	44.6	44.6	75.0	66.4	72.4	71.3	5	15	11	0	1	0
Feb.....	10	6	19	4	15	8	10	11	1	2.34	1.21	12	3.8	5.9	3.3	4.3	47.5	49.8	49.8	49.8	76.9	59.3	74.7	70.3	13	9	6	8	0	0
Mar.....	7	3	6	2	15	19	19	9	0	3.31	1.02	8	5.0	4.3	2.7	4.0	39.3	40.2	43.3	40.9	65.0	45.5	61.8	58.1	13	11	5	8	0	0
Apr.....	10	4	15	10	20	11	10	9	0	3.92	2.46	9	5.0	6.4	4.0	5.3	55.8	55.6	57.1	56.2	76.0	57.0	73.5	68.8	7	15	7	9	0	0
May.....	9	1	6	16	23	11	11	11	0	5.22	3.21	1	3.2	4.0	2.5	3.2	59.1	56.7	60.0	58.6	71.0	50.0	71.5	64.2	14	16	1	6	0	0
June.....	4	5	8	14	20	18	18	3	0	5.93	1.97	8	4.1	5.0	4.5	4.5	70.6	68.9	71.2	70.2	78.0	57.0	79.6	71.5	19	17	4	13	0	11
July.....	8	4	13	8	28	13	12	7	0	4.56	1.61	7	3.9	5.2	3.7	4.3	72.2	70.7	73.3	72.1	74.5	54.3	76.0	68.3	10	16	5	10	0	17
Aug.....	12	10	10	10	19	14	12	5	1	9.28	4.03	7	3.8	4.3	3.2	3.8	70.9	70.0	72.1	71.0	81.6	58.9	81.0	73.8	13	16	2	12	0	0
Sept.....	26	6	11	18	10	7	2	9	1	2.55	.98	14	4.6	5.5	3.6	4.6	65.3	65.2	67.4	66.0	84.8	60.1	82.8	75.9	12	11	7	6	0	0
Oct.....	28	19	14	6	4	4	9	7	2	1.41	.65	4	5.4	5.5	4.4	5.1	60.4	60.8	63.1	61.4	85.1	61.1	83.3	76.5	7	16	8	10	0	3
Nov.....	27	5	12	17	12	4	1	12	0	.58	.50	20	4.3	4.5	3.1	4.0	47.1	47.3	49.0	47.8	79.8	51.5	73.7	68.3	13	12	5	3	0	1
Dec.....	16	9	11	7	15	11	10	13	1	1.99	1.26	27	3.5	5.1	4.0	4.2	43.8	49.0	47.1	46.6	77.6	59.4	73.2	70.1	14	11	6	5	0	0
Sums ..	170	77	140	119	200	129	124	126	7	48.43	.....	.....	51.7	62.8	44.4	753.5	674.3	698.0	684.4	925.3	680.5	905.5	837.1	130	165	67	105	0	3	45
Means .	15.67	11.2	9.10	9.18	4.11	8.11	4.11	5.06	.....	4.3	5.2	3.7	4.4	56.2	56.8	58.2	57.1	77.1	56.7	75.5	69.8	35.9	45.6	61.8	528.8	0.0	0.8	12.3	.....	.....
	Percentages.																													

\* One 7 a. m. and one 11 p. m. observation missed.

\* One 11 p. m. observation missed.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 6.44 a. m., 2.44 p. m., and 10.44 p. m., local time. Correction for instrumental error of barometer used: From 0.44 a. m., June 1, to 10.44 p. m., December 31, inclusive, — .009 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.090; March, 0.090; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.090; December, 0.100.

H. W. FORD  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SHAW, FORT, MONT.

[Latitude, 47° 51' N.; longitude, 111° 49' W. Magnetic variation 20° 45' E. Elevation of barometer above sea-level, 3,580 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 2½ feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.		Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Δboiling range.	Mean maximum.	Mean minimum.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Total Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Jan.	26.335	26.335	26.323	26.331	26.515	18.25	850	11	8.59	12.6	19.7	16.5	15.6	49	9.10.11	33	19	32	27.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

B.—Elevations determined by barometer.

• September.

† April.

; June.

; February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—					Remarks.						
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 90°.			
									Largest amount.	Date.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.	
1883.																																
Jan.	8	10	7	1	4	26	19	5	3	0.54	0.18	29	4.0	6.8	5.5	5.7	3.6	8.4	6.7	6.2	74.7	63.8	67.2	68.6	5	18	8	9	16	28	0	
Feb.	3	7	1	1	0	33	28	9	7	0.81	0.12	23	3.7	4.7	3.0	3.8	3.2	8.9	5.6	5.9	68.0	56.0	64.4	63.1	10	14	4	7	14	22	0	
Mar.	12	5	6	4	2	19	28	15	2	1.05	0.31	24	4.4	5.0	5.2	4.9	15.4	20.5	19.7	18.5	71.0	44.5	65.8	60.4	10	11	10	13	7	26	0	
Apr.	1	12	7	5	2	34	25	3	1	0.50	0.20	25	4.0	5.0	3.5	4.5	22.4	26.5	26.8	25.2	72.1	42.3	61.6	58.7	8	14	8	8	1	19	0	
May	6	14	10	4	3	27	22	7	0	2.30	0.82	1	5.6	3.9	3.0	5.7	33.3	33.3	36.0	31.3	78.8	48.7	67.3	64.9	2	10	10	10	0	4	0	
June	4	10	6	4	3	21	32	7	3	2.38	0.67	7	8	4.1	3.6	3.7	41.1	43.7	46.1	43.6	74.2	43.2	61.5	59.5	6	12	14	4	10	0	0	
July	5	18	3	7	0	20	39	1	0	0.15	0.07	4	2.8	3.6	3.1	3.2	38.0	38.0	40.7	39.1	68.8	29.6	45.2	47.3	13	18	0	4	0	0	1	
Aug.	0	18	13	3	0	19	38	1	1	0.97	0.58	21	1.9	3.1	3.2	2.4	40.0	40.9	42.5	41.1	68.9	32.3	47.4	49.5	23	4	4	4	0	0	0	
Sept.	2	15	9	7	1	17	32	5	2	0.70	0.73	1	2.1	2.9	1.8	2.3	35.1	36.8	37.1	36.3	70.6	37.4	55.4	56.5	21	7	2	3	0	0	0	
Oct.	6	3	7	1	3	15	43	8	7	2.22	0.49	14	1.5	6.5	5.3	5.6	27.1	29.3	29.2	28.7	84.6	62.8	79.6	75.7	7	15	9	11	0	18	0	
Nov.	8	6	8	3	2	24	34	7	3	0.83	0.46	25	4.5	6.0	4.5	4.9	18.1	20.0	16.5	18.2	72.9	56.3	65.8	60.5	7	17	6	9	6	24	0	
Dec.	3	9	3	0	0	44	14	3	17	0.54	0.22	25	2.9	4.5	6.0	3.9	4.8	15.4	15.6	14.8	15.3	68.5	53.1	60.0	60.5	6	18	7	6	10	22	0
Sums	53	127	90	40	20	309	352	63	46	12.64	.....	49	3.57	7.47	6.51	6.283	23.22	23.22	23.22	23.22	73.12	47.87	61.57	60.74	124	169	72	94	54	171	5	
Means	4.811	67.33	7.1	8.28	2.32	1	6.24	2	.....	.....	4.1	4.8	4.0	4.8	24.4	26.9	26.8	26.0	73.2	47.5	61.8	60.8	84.0	46.8	19.7	23.6	8.14	8.46	8.1	0		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.41 a. m., 12.41 p. m., and 9.41 p. m., local time.

Correction for instrumental error of barometer used: From 4.41 a. m., January 1, to 8.41 p. m., December 31, inclusive,  $\pm 0.001$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.86; February, 2.88; March, 2.80;

April, 3.67; May, 3.60; June, 3.57; July, 3.51; August, 3.53; September, 3.61; October, 3.70; November, 3.82; December, 3.83.

A. I. MATHEWS,

Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## SHREVEPORT, LA.

[Latitude, 32° 30' N.; longitude, 92° 40' W. Magnetic variation, 8° 20' E. Elevation of barometer above sea-level, 227 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 44 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.						Maximum hourly velocity during month.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.	Washington time.			Washington time.			Total.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.		Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.			Mean minimum.	7 a. m. to 3 p. m.				3 p. m. to 11 p. m.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	11 p. m. to 7 a. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1882.	In. 29.955	In. 29.985	In. 29.919	In. 29.940	In. 29.940	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29.950	In. 29

For 37 days.

February.

April.

July 21, August 13.

January.

Average.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.										Number of days—					Remarks.										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Total amount			Any 3 consecutive 8 hourly measure-ments.			Cloudiness (in tenths).			Dew-point.				Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	
											Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.											
1883.																																			
Jan.....	16	13	8	10	14	1	2	28	1	3.54 1.06	19 20	6.4	7.0	4.8	6.1	33.3	34.8	35.2	34.4	82.0	65.4	74.6	74.0	1	15	1	0	0	0	0	0				
Feb.....	25	11	9	9	13	2	3	8	4	7.24 1.78	11 12	6.9	8.1	7.1	7.4	30.0	40.2	40.6	39.9	84.1	68.6	78.1	76.9	6	1	6	0	0	0	0	0				
Mar.....	13	13	6	6	24	4	13	13	1	5.83 2.37	24	5.2	5.6	5.0	5.6	42.5	42.7	44.9	43.4	78.1	50.8	67.7	65.5	9	11	10	0	0	0	0	0				
Apr.....	12	3	3	13	24	7	18	10	4	4.45 1.09	30	6.1	5.7	2.8	4.5	54.9	55.0	55.1	55.0	86.2	52.8	70.0	70.0	10	13	7	0	0	0	0	0				
May.....	4	4	10	19	33	4	2	14	8	1.40 1.82	30	6.1	6.5	2.8	5.1	60.5	53.4	61.8	60.2	82.7	46.2	71.3	66.7	8	16	7	0	0	0	0	0				
June.....	8	2	9	12	27	11	11	5	5	5.70 2.20	5	4.7	6.6	2.4	4.6	69.6	69.1	70.9	69.9	86.2	52.6	76.2	71.7	11	15	4	0	0	0	0	0				
July.....	7	2	3	11	39	17	12	1	1	1.22 1.42	7	5.1	6.2	1.7	4.3	71.0	67.9	71.3	70.1	82.9	44.1	72.1	66.4	10	19	2	0	0	0	0	0				
Aug.....	21	17	6	5	20	2	5	9	6	7.2 1.42	7	3.5	4.4	1.7	3.2	68.0	64.2	68.1	66.8	84.2	41.3	69.4	65.0	13	17	1	0	0	0	0	0				
Sept.....	11	16	8	15	12	4	11	11	7	1.29 1.27	15 16	7	3.6	4.0	3.2	58.5	56.0	60.4	58.3	80.2	38.2	66.5	61.8	15	11	4	0	0	0	0	0				
Oct.....	7	16	7	10	29	7	4	6	1	1.97 1.27	26	6.6	6.4	3.1	5.4	59.8	59.8	61.1	60.2	83.5	54.4	76.3	72.1	9	14	8	0	0	0	0	0				
Nov.....	13	18	5	14	29	2	4	6	2	8.66 4.53	10 11	6.2	6.6	4.3	5.4	45.5	44.6	47.8	46.0	78.2	53.0	73.2	68.1	9	12	9	0	0	0	0	0				
Dec.....	22	3	11	14	20	5	5	13	0	3.07 2.01	5 6	6.8	6.1	5.1	6.0	40.3	40.3	40.3	41.5	40.7	78.3	54.8	70.4	67.8	10	7	14	0	0	0	0				
Sums.....	160	118	80	144	294	66	85	121	37	43.11	.....	67.7	71.8	62.0	64.2	633.0	658.7	644.9	688.6	622.2	866.7	825.8	118	149	98	98	1	20	114						
Means.....	14.6	10.87	3.13	22.5	9.6	7.8	11.1	13.4	.....	.....	.....	5.6	6.0	3.6	5.1	53.6	52.8	54.9	53.8	82.4	51.8	72.2	68.8	8.32	3.40	8.28	8.0	3	5.5	93.2					
	Percentages.											Percentages.										Percentages.													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.54 a. m., 1.54 p. m., and 6.54 p. m., local time. Correction for instrumental error of barometer used: From 5.54 a. m., January 1, to 9.54 p. m., December 31, inclusive, +.025 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.25; April, 0.24; May, 0.24; June, 0.23; July, 0.23; August, 0.23; September, 0.24; October, 0.24; November, 0.25; December, 0.25.

L. A. WELSH,  
Sergeant, Signal Corps, U. S. A.

**APPENDIX 76.—Meteorological summary for the year ending December 31, 1883—Continued.**

# THESE

Latitude, 57° 3' N.; longitude, 135° 19' W. Magnetic variation, 29° 54' E. Elevation of barometer above sea-level, 63 feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 24 feet.

Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																						
Washington time.			Monthly mean.			Highest.			Lowest.			Date.			Range.			Washington time.			Self-registering ther- mometers.			Mean maximum.			Mean minimum.			Washington time.			Total.			Maximum hourly velocity during month.		
7 a.m.	3 p.m.	11 p.m.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	In.	W.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	7 a.m.	3 p.m.	11 p.m.	Miles.	Miles.	Miles.	Direction from—						
1883.																																						
Jan	29.836	29.818	29.821	29.823	30.514	31.28	30.157	4	1.457	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7					
Feb	30.012	29.985	29.956	29.955	30.601	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Mar	29.893	29.849	29.833	29.843	30.173	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Apr	29.647	29.655	29.637	29.653	30.373	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
May	29.836	29.850	29.846	29.844	30.387	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
June	29.872	29.862	29.860	29.855	30.214	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
July	29.906	29.901	29.904	29.900	30.485	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Aug	29.951	29.944	29.935	29.943	30.210	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Sept	29.779	29.776	29.760	29.772	30.388	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Oct	29.540	29.534	29.547	29.540	30.233	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Nov	29.706	29.766	29.752	29.771	30.407	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Dec	29.610	29.563	29.557	29.563	30.440	31.28	29.8	10	1.433	32.1	37.4	38.2	37.1	37.3	35.0	38.5	19.0	31.8	32.5	18.1	41.6	32.9	32.9	1.905	2.157	2.045	9	105	45	E.	7							
Sums.	356.039	357.946	357.868	357.967								504.0	552.3	538.1	531.9																							
Means	29.587	29.839	29.824	29.830	30.661	31.28	757	129				42.1	46.0	44.8	44.9	39.4	427	5.0	129																			
																												</										

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Any 8 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Fair.		Cloudy.	.91 inch or more of water.	Minimum below 32°.	Maximum above 32°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.								3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 3.07 a. m., 11.07 a. m., and 7.07 p. m., local time.

Correction for instrumental error of barometer used: From 3.07 a. m., January 1, to 7.07 p. m., December 31, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.070; November, 0.070; December, 0.070.

FRED. W. FICKETT.  
Private, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SMITHVILLE, N. C.

[Latitude, 35° 55' N.; longitude, 78° 1' W. Magnetic variation, 0°. Elevation of barometer above sea-level, 34 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 38 feet.]

Barometer (corrected for temperature and instrumental error only).													Temperature.					Wind.							
Month.	Washington time.				Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.				Total.	Miles.	Direction from—	Maximum hourly velocity during month.
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.						11 p. m.	3 p. m.	7 a. m.	Date.	Minimum.	Absolute range.			11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.					
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.									Miles.	Miles.	Miles.					
Jan.	30.166	30.122	30.162	30.150	30.636	29.473	29.919	9	1.68	42.6	48.4	45.8	45.8	12.42	52.5	39.8	1.789	1.969	2.017	5.775	23	S. W.	21		
Feb.	30.271	30.234	30.270	30.258	30.561	30.291	29.961	25	6.00	49.6	55.9	50.7	52.1	27.36	59.8	45.8	1.902	2.404	2.459	6.765	28	S. E.	25		
Mar.	30.020	30.060	30.083	30.093	30.398	30.616	30.291	26	8.92	44.5	53.5	48.5	48.8	19.27	57.4	41.0	2.207	2.798	3.006	8.011	38	N. E.	28		
Apr.	30.097	30.058	30.002	30.098	30.366	30.288	29.983	23	8.73	54.7	62.9	58.1	59.2	20.40	65.1	52.9	2.292	2.828	2.828	7.646	34	S. W.	23		
May	30.091	30.047	30.072	30.070	30.243	30.238	29.983	21	8.21	64.9	74.6	68.5	68.5	31.48	75.0	60.2	2.253	2.947	2.649	7.849	36	S.	31		
June	30.072	30.064	30.061	30.093	30.254	30.250	29.983	26	5.04	75.5	80.8	73.4	77.2	21.64	83.5	71.4	2.024	2.811	2.980	7.815	38	N.	2		
July	30.042	30.010	30.032	30.028	30.292	30.228	29.983	13	5.86	79.3	85.8	79.5	81.5	17.25	87.2	75.2	2.024	2.811	2.781	7.397	24	S.	9		
Aug.	30.003	30.007	30.000	30.009	30.152	30.238	29.983	29	3.78	75.0	83.1	79.1	78.1	3.58	84.6	71.7	1.783	2.583	2.868	6.704	29	S.	4		
Sept.	30.003	30.059	30.046	30.079	30.225	30.230	29.983	11	1.081	69.6	76.7	70.9	72.4	4.5	78.4	66.7	1.112	3.182	2.668	7.953	38	S. E.	11		
Oct.	30.081	30.036	30.045	30.061	30.401	30.298	29.983	29	6.13	62.2	70.9	64.1	65.7	8.48	72.7	59.8	2.265	2.859	2.825	7.649	38	S. E.	13		
Nov.	30.106	30.137	30.172	30.168	30.561	30.288	29.983	14	6.87	51.4	61.6	54.5	55.8	23.30	63.5	48.4	1.872	2.458	1.858	6.188	27	N. E.	27		
Dec.	30.148	30.100	30.141	30.130	30.380	30.267	29.983	27	7.13	47.6	56.5	51.1	51.7	8.24	59.4	43.8	1.885	2.383	1.944	6.192	33	W.	17		
Sums.	360.910	360.394	360.772	360.608	.....	.....	.....	.....	.....	718.9311.7	740.2	754.8	.....	.....	840.0	676.2	24.376	31.792	29.763	85.953	.....	.....	.....		
Means.	30.076	30.038	30.064	30.058	30.636	30.244	29.983	.....	.....	59.9	67.6	61.7	63.1	112	70.0	58.4	5.031	5.2	640.3	2.451.9	.....	.....	.....		

\* January.

† September.

‡ July.

§ August.

|| January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Rainfall or melted snow.		Washington time.								Number of days—					Remarks.							
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Cloudy.		.01 inch or more of water.	Maximum below 82°.	Minimum below 32°.	Maximum above 90°.			
									Total amount.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.								3 p. m.	11 p. m.	Mean.
1883.																														
Jan.....	21	20	8	0	4	15	9	0	5.63 1.42	9	6.5	5.8	5.2	5.8	39.2	43.3	42.5	41.7	88.6	81.3	90.1	86.7	5	15	11	0	6	0		
Feb.....	11	26	4	3	8	13	5	1	2.33 1.58	24.25	3.3	6.7	4.1	4.7	45.2	47.0	46.9	46.4	85.7	75.5	87.8	83.0	10	10	8	0	0	0		
Mar.....	18	15	6	4	5	19	16	10	0.13 2.57	23.26	4.8	5.8	3.9	4.7	37.5	42.6	41.9	40.7	77.4	68.7	80.1	75.4	11	12	8	0	0	0		
Apr.....	13	12	18	4	13	15	10	5	0.54 1.97	23.23	5.5	7.5	5.7	5.9	52.7	55.1	54.3	54.3	86.6	77.0	89.9	84.5	5	15	10	0	0	0		
May.....	16	12	6	3	5	35	11	5	0.60 1.96	1.2	4.1	3.2	2.3	3.2	57.8	58.5	59.9	58.7	78.8	60.3	81.4	73.5	17	9	5	6	0	0		
June.....	3	11	2	12	11	34	13	4	0.65 2.76	2	5.7	5.6	3.6	5.0	69.6	70.9	70.3	82.3	72.5	85.2	80.0	9	13	8	11	0	0	1		
July.....	4	5	7	19	12	26	17	8	0.89 3.31	30.31	4.4	3.8	3.1	3.8	72.1	73.7	72.6	72.8	78.9	67.9	80.1	75.6	11	17	8	10	0	0		
Aug.....	18	19	9	5	7	22	10	2	1.25 1.38	8	4.2	5.3	3.3	4.3	68.9	69.6	69.5	68.7	81.7	65.2	81.7	76.2	12	13	6	8	0	0		
Sept.....	13	23	13	4	8	21	6	2	0.69 4.24	10.11	5.4	5.6	4.1	4.9	66.1	67.5	66.2	66.6	88.9	74.9	85.6	83.1	12	9	9	11	0	0		
Oct.....	26	27	14	1	6	9	6	4	0.19 .44	12.13	6.7	5.4	4.4	5.5	58.6	61.4	59.7	59.9	88.2	73.2	85.6	82.8	8	13	10	9	0	0		
Nov.....	31	11	6	6	14	13	3	6	0.85 .14	25	4.2	5.0	3.8	4.3	45.0	46.9	46.6	46.2	70.5	61.8	73.6	72.3	10	13	7	6	0	1		
Dec.....	18	17	9	5	5	14	12	12	1.57 .41	27	4.1	4.0	3.4	3.8	42.4	46.1	44.0	44.2	82.8	71.1	78.2	77.4	11	16	4	9	0	0		
Sums...	192	186	102	66	98	236	183	67	3 46.67	58.0	63.7	45.9	55.9	65.5	1 682.5	871.8	871.3	899.4	849.4	1,001.3	950.0	121	155	89	117	0	13	4		
Means	17.5	15.1	8.3	5.2	9.0	21.6	10.3	0.3	.....	.....	4.8	5.3	3.8	4.6	54.6	56.9	56.8	56.9	83.3	70.8	83.4	79.2	233.2	242.5	24.4	32.1	0.0	3.6	1.1	
	Percentages.							Percentages.																						

Notiz.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time.

Correction for instrumental error of barometer used: From 6.56 a. m., January 1, to 10.56 p. m., December 31, inclusive, -1.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.030; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

ORIN PARKER,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SPRINGFIELD, ILL.

[Latitude, 39° 49' N.; longitude, 89° 39' W. Magnetic variation, 9° 19' E. Elevation of barometer above sea-level, 644 feet. Elevation of exposed thermometer above ground, 39 feet. Elevation of rain-gauge above ground, 61 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.						
	Washington time.			Monthly mean.			Self-registering thermometers.				Washington time.			Washington time.			Maximum hourly velocity during month.						
	7 p. m.	8 p. m.	11 p. m.	Highest.	Date.	Lowest.	Range.	Date.		Minimum.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m. to 11 p. m.	8 p. m. to 11 p. m.	9 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Date.			
								Maximum.	Date.														
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.		
Jan.	29.407	29.450	29.476	29.464	29.060	22.28.871	30	1.109	29.445	29.445	26	10.0	21	55.0	29.6	29.6	29.6	2.280	2,625	7,707	42	NW.	10
Feb.	29.369	29.359	29.379	29.375	29.074	18.28.917	24	1.167	29.364	29.364	16	2.4	9	66.4	29.4	29.4	29.4	2,011	5,933	30	8	S.	16
Mar.	29.390	29.355	29.379	29.375	29.074	3.28.862	18	1.064	29.373	29.373	18	13.5	7	59.5	29.7	29.7	29.7	2,457	8,026	8,181	40	NE.	18
Apr.	29.205	29.224	29.243	29.244	29.016	2.28.696	22	0.920	29.243	29.243	14	30.0	2	55.0	29.9	29.9	29.9	2,497	7,491	36	8	S.	14
May	29.282	29.251	29.254	29.206	29.031	0.28.830	14	0.801	29.253	29.253	9	33.9	22	53.1	29.6	29.6	29.6	2,497	7,491	36	8	S.	18
June	29.281	29.257	29.257	29.265	29.587	1.28.877	10	0.710	29.253	29.253	29	43.8	14	41.0	29.9	29.9	29.9	1,493	2,114	40	N.	N.	21
July	29.370	29.339	29.340	29.350	29.079	18.28.030	12	0.649	29.340	29.340	4	54.0	8	41.0	29.9	29.9	29.9	1,742	5,335	40	N.	N.	18
Aug.	29.419	29.380	29.383	29.401	29.031	0.28.194	21	0.437	29.401	29.401	22	54.9	24	38.1	29.9	29.9	29.9	1,538	6,017	32	N.	N.	13
Sept.	29.410	29.381	29.381	29.384	29.739	9.28.040	24	0.699	29.361	29.361	15	39.4	9	43.6	29.9	29.9	29.9	1,816	4,039	31	NW.	NW.	2
Oct.	29.413	29.398	29.404	29.407	29.852	15.28.765	29	1.067	29.398	29.398	8	34.4	12	43.4	29.9	29.9	29.9	2,096	6,817	81	S.	S.	18
Nov.	29.402	29.410	29.420	29.431	30.001	10.28.877	21	1.124	29.410	29.410	4	12.5	16	55.0	29.9	29.9	29.9	2,458	7,013	36	S.	S.	26
Dec.	29.413	29.395	29.433	29.414	29.750	14.28.835	26	0.915	29.385	29.385	1	4.1	17	59.9	29.9	29.9	29.9	2,472	7,092	30	S.	S.	6
Sums.	352.766	352.889	353.569	352.577	.....	.....	.....	.....	553.7	684.2	590.5	612.6	.....	.....	728.8	503.6	24.409	29.215	27.228	90.852	.....	.....	.....
Means.	29.397	29.366	29.381	29.381	29.074	15.28.806	122	.....	46.1	57.0	50.0	51.0	.....	.....	60.7	42.0	2.034	112.434	92.286	0	.....	.....	.....
Average.															Average.						.....		
.....															.....						.....		

For 27 days and 11 hours.

February.

March.

1 For 27 days and 11 hours

\* February.

† April.

‡ July.

§ January.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 8 consecutive hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).					Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
											Largest amount.	Date.	7 a. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1883.										<i>In.</i>	<i>In.</i>																					
Jan.....	10	6	6	10	12	8	21	20	0	1.96	0.53	19, 17	7.1	6.4	5.8	6.4	13.8	11.0	12.7	12.5	77.7	59.0	72.6	69.8	3	17	11	16	15	31	0	
Feb.....	6	11	8	9	11	8	23	2	7.53	3.56	2, 3	4.4	4.9	4.4	4.9	30.4	21.2	21.1	20.9	79.0	61.4	72.8	71.1	10	10	8	10	8	21	0		
Mar.....	12	16	4	6	4	18	8	25	0	1.36	0.60	5, 6	4.8	5.2	5.5	5.2	26.1	26.0	24.2	24.1	72.3	49.8	66.2	62.8	9	14	7	14	0	21	0	
Apr.....	9	13	4	12	25	7	11	7	2	4.42	1.61	21, 22	4.6	5.4	5.4	4.7	38.7	39.8	41.4	40.0	72.4	47.5	66.2	61.7	9	14	7	14	0	4	0	
May.....	14	2	5	8	30	6	14	13	7	6.61	2.30	25, 26	5.9	5.7	4.4	5.3	46.3	47.5	48.6	47.5	74.0	52.6	69.0	65.2	6	18	7	17	0	0	0	
June.....	11	5	3	11	15	13	13	15	4	8.40	2.60	8, 9	6.0	6.9	4.3	6.4	59.1	60.1	61.6	60.3	81.9	60.6	74.5	73.7	6	16	8	17	0	0	0	
July.....	9	6	4	5	30	21	12	6	0	3.77	1.38	16, 17	3.6	3.9	3.0	3.5	62.4	62.8	64.7	63.3	77.8	53.4	75.5	68.9	17	10	4	8	0	0	0	
Aug.....	10	13	14	7	13	12	10	13	1	0.95	0.59	15, 16	3.3	3.4	2.1	3.6	57.3	57.5	59.4	58.1	79.0	51.5	71.2	67.2	10	19	2	4	0	0	0	
Sept.....	14	16	14	6	17	9	10	4	0	1.06	0.69	16, 8	3.0	2.8	2.3	2.7	47.7	48.6	48.7	48.7	76.9	43.6	65.7	62.1	17	11	2	4	0	0	0	
Oct.....	13	20	12	11	15	1	7	14	0	6.08	1.85	4, 5	6.8	6.6	5.4	6.3	43.8	44.1	44.6	44.2	81.8	63.1	76.5	73.8	5	12	14	16	0	0	0	
Nov.....	8	2	6	3	25	10	8	24	0	3.45	1.37	20, 21	3.3	4.4	2.7	3.8	30.9	31.3	33.1	31.7	73.2	50.7	67.5	63.8	12	14	4	7	2	11	0	
Dec.....	11	3	6	8	25	11	17	7	0	3.17	1.17	22, 23	5.0	5.8	5.8	5.5	24.0	25.0	25.8	24.9	77.3	61.0	74.5	71.0	9	13	10	11	3	19	0	
Sums ..	122	107	85	88	230	127	140	180	16	43.79	.....	54	563	561	857	3,470	5,474	5,438	5,473	2,923	3,654	2,853	3,811	114	103	88	138	28	107	7		
Means ..	Percentages.																									Percentages.						
	11. 19. 8.7. 8.8. 0.21. 0.11. 6.12. 8.16. 4.1. 5.																									37.6. 31.4. 7.94. 18.7. 3.7. 7.29. 31.9.						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.10 a. m., 2.10 p. m., and 10.10 p. m., local time.

Correction for instrumental error of barometer used: From 6.10 a. m., January 1, to 10.10 p. m., December 31, inclusive,  $\pm$ .013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.730; February, 0.730; March, 0.730; April, 0.700; May, 0.670; June, 0.670; July, 0.600; August, 0.660; September, 0.670; October, 0.680; November, 0.730; December, 0.730.

T. B. JENNINGS,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

SPOKANE FALLS, WASH. T.

[Latitude, 47° 39' N.; longitude, 117° 24' W. Magnetic variation, 21° 30' E. Elevation of barometer above sea-level, 1,906 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 32 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.							
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering ther- mometers.			Mean minimum.		Washington time.			Maximum hourly velocity during month.	
	7 p. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	7 a. m. to 11 p. m.	8 p. m. to 11 p. m.	3 p. m. to 11 p. m.	Total.		Miles. Mph.
1883.																						
Jan.	In. 28.064	In. 28.068	In. 28.048	In. 28.076	In. 28.364	19	27.588	11	.906	20.1	25.9	28.3	23.8	47.2	0	31.1	16.2	1,131	900	1,290	3,311	
Feb.	In. 28.207	In. 28.204	In. 28.206	In. 28.212	In. 28.690	4	27.874	13	1.306	14.0	23.7	21.6	19.8	47.3	28	30.5	30.6	562	603	855	1,990	
Mar.	In. 28.052	In. 28.062	In. 28.013	In. 28.042	In. 28.452	2	27.517	28	.935	33.5	44.4	42.4	40.8	67.2	20	42.2	33.5	30.6	562	944	1,166	2,672
Apr.	In. 27.913	In. 27.910	In. 27.908	In. 27.910	In. 28.235	4	27.443	19	.792	39.3	51.8	47.0	46.0	70.0	23	28.0	35.7	35.7	1,319	1,731	2,089	5,139
May	In. 27.975	In. 27.968	In. 27.949	In. 27.964	In. 28.392	19	27.545	12	.847	46.5	62.1	57.2	55.3	78.7	11	34.0	43.5	43.5	850	1,371	1,538	3,854
June	In. 28.009	In. 27.991	In. 27.943	In. 27.961	In. 28.275	5	27.621	13	.654	52.9	73.6	68.5	65.3	95.4	28	38.2	53.4	49.7	968	1,333	1,543	3,854
July	In. 28.042	In. 28.009	In. 27.968	In. 28.006	In. 28.155	24	27.788	12	.367	57.7	81.1	74.4	71.1	96.7	8	46.0	53.4	53.4	743	1,086	1,086	2,414
Aug.	In. 28.019	In. 27.970	In. 27.940	In. 27.976	In. 28.229	19	27.740	20	.489	56.2	78.6	71.6	68.8	96.3	3	38.0	52.5	52.5	672	801	1,064	2,567
Sept.	In. 28.022	In. 28.023	In. 27.975	In. 28.006	In. 28.389	20	27.679	29	.710	47.6	66.7	58.8	57.7	84.0	4	35.0	44.2	44.2	382	850	1,129	2,648
Oct.	In. 27.996	In. 27.952	In. 27.930	In. 27.949	In. 28.317	10	27.952	27	.965	37.7	50.2	44.9	44.3	70.4	3	24.0	33.0	33.0	669	850	1,129	2,648
Nov.	In. 27.994	In. 27.952	In. 27.946	In. 27.961	In. 28.367	11	27.955	24	1.032	34.5	43.2	39.4	39.0	57.6	11	19.8	25.7	25.7	1,137	970	1,278	3,375
Dec.	In. 28.053	In. 28.059	In. 28.056	In. 28.056	In. 28.670	31	27.326	26	1.353	25.9	32.9	29.7	29.5	47.0	1	8.5	22.4	22.4	840	963	970	2,873
Sums.	334.326	334.304	334.305	334.306	334.330					405.9	436.2	431.8	501.4			603.8	424.7	9,765	11,827	15,494	37,086	
Means.	28.028	28.017	27.990	28.012	28.690	*4	27.826	126		38.8	53.0	48.5	46.8	96.7	18	27.7	35.4	313.9	385.6	501.2		

\* February.

† December.

‡ July.

§ January.

|| For 294 days.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.										Number of days—						Remarks.						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 consecutive 8 hourly measurements.		Cloudiness (in tenths).				Dew-point.				Relative humidity (per cent.).				Clear.		Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
										In.	In.	Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.								
1883.																																	
Jan.....	7	19	4	0	8	20	7	13	15	2.13	0.41	5	17, 18	7.2	8.1	6.8	7.4	15.7	21.3	21.4	19.5	82.6	83.1	84.6	83.4	2	14	15	18	13	28	0	
Feb.....	1	6	32	4	2	12	3	3	21	2.95	1.14	17, 18	30, 33	3.2	4.6	3.1	3.6	9.0	17.4	16.8	14.4	80.2	77.5	81.4	79.7	15	7	6	13	14	23	0	
Mar.....	4	19	16	4	8	12	4	4	22	0.75	0.34	28, 29	30, 33	3.3	4.5	2.5	3.4	30.3	36.3	35.6	34.1	88.6	70.4	78.3	79.1	15	11	5	5	0	21	0	
Apr.....	10	7	11	2	17	32	3	2	6	1.93	0.50	30, 33	30, 33	3.8	6.2	2.9	4.3	34.4	35.4	35.6	35.1	83.2	57.9	66.9	69.3	9	16	5	13	0	6	0	
May.....	7	17	11	2	21	22	6	4	3	2.11	0.61	10, 11	10, 11	4.6	4.4	2.2	3.7	40.7	40.5	43.9	41.7	80.9	50.0	64.2	65.0	14	14	3	9	0	0	0	
June.....	10	5	0	2	15	31	15	4	8	0.60	0.60	10, 11	10, 11	2.4	2.8	1.9	2.4	45.3	43.1	46.3	44.9	75.5	36.6	45.4	52.5	19	9	2	2	0	0	2	
July.....	11	11	1	4	5	33	9	5	14	0.00	0.00	.....	.....	1.6	2.2	1.5	1.8	46.2	42.6	46.5	45.1	66.2	26.6	38.6	43.8	23	8	0	0	0	0	5	
Aug.....	21	7	0	0	7	25	10	1	22	0.15	0.15	16, 17	16, 17	1.1	1.2	1.4	1.2	41.5	49.0	47.2	45.9	59.2	38.8	42.6	46.9	27	3	1	1	0	0	7	
Sept.....	15	4	6	0	8	16	5	6	30	0.08	0.04	8, 9	8, 9	1.8	1.8	0.7	1.4	39.9	46.5	43.9	43.4	74.8	49.7	60.0	61.5	23	7	0	0	0	0	0	
Oct.....	16	11	3	3	13	20	7	1	19	1.48	0.40	17	17	3.9	5.5	4.1	4.5	30.3	37.3	36.6	34.7	75.5	65.9	74.7	72.0	11	12	8	10	0	11	0	
Nov.....	9	5	1	0	18	32	9	4	11	1.98	0.64	24	24	5.1	4.5	4.2	4.6	28.6	36.0	33.2	32.6	79.1	77.4	79.7	78.7	10	13	7	12	1	18	0	
Dec.....	21	2	2	1	5	14	12	14	23	0.21	0.06	21	21	4.3	4.5	3.5	4.1	18.1	25.3	22.3	21.9	71.6	75.2	73.4	73.4	13	12	6	7	9	29	0	
Sums...	132	113	87	22	127	269	90	61	194	14.37	.....	.....	.....	42.35	3.50	3.34	3.42	4.380	0.430	7.429	3.413	3.917	4.709	1.789	8.805	3	181	126	58	94	37	136	14
Means...	Percentages.								Percentages.										Percentages.														
	12.1	10.37	9.2	0.11	6.24	6.8	2.5	6.17	7	.....	.....	.....	.....	3.5	4.2	2.9	3.5	31.7	35.9	35.8	34.4	76.4	59.1	65.8	67.1	149	634	515	925	810	137	33.8	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.19 a. m., 12.19 p. m., and 8.19 p. m., local time.

Correction for instrumental error of barometer used: From 4.19 a. m., January 1, to 8.19 p. m., December 31, inclusive,  $\pm .005$  inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .214; February, 2.13; March, 2.13; April, 2.06; May, 2.05; June, 2.04; July, 1.98; August, 2.00; September, 2.04; October, 2.08; November, 2.08; December, 2.13.

D. MOORE,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

STARKVILLE, MISS.

[Latitude, 33° 39' N.; longitude, 88° 49' W. Magnetic variation, 6° E. Elevation of barometer above sea-level, 445 feet. Elevation of exposed thermometer above ground, 41 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error).							Temperature.						Wind.											
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Washington time.			Maximum hourly velocity during month.	Direction from—	Date.				
	7 a. m.	3 p. m.	11 p. m.					7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.			Date.	Absolute range.								
1883.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Miles.		
Jan.	28.698	28.657	28.690	28.682	30.239	27.23	318	39.4	49.0	43.8	43.9	71	27	17	21	54	62.3	38.3	2,181	2,217	2,128	9,526	32	SW.	30
Feb.	28.799	28.752	28.774	28.775	30.237	27.23	365	44.8	56.0	51.5	50.8	81	16	24	18	57	61.6	42.2	2,277	2,374	2,274	9,865	30	SW.	24
Mar.	28.623	28.558	28.580	28.587	30.018	1.23	207	46.2	60.6	52.5	53.1	79	30	20	51	63.2	43.6	2,316	2,361	2,361	9,961	28	N.W.	10	
Apr.	28.517	28.475	28.492	28.485	28.885	3.28	889	58.8	71.1	63.5	64.5	85	13	14	3	45	73.7	73.8	1,979	2,360	2,238	9,677	87	N.W.	11
May	28.575	28.537	28.543	28.533	28.785	6.23	225	63.4	78.4	68.1	69.3	87	8	40	22	47	78.2	59.3	1,930	2,342	2,055	9,337	84	SW.	12
June <sup>1</sup>	28.587	28.522	28.530	28.540	28.750	1.23	312	72.1	84.6	76.1	77.6	90	12	15	32	86.0	68.8	1,850	2,342	2,055	9,696	84	SW.	13	
July.																									
Aug.																									
Sept.																									
Oct.																									
Nov.																									
Dec.																									
Sums.																									
Means.																									
																				</					

<sup>1</sup> Station closed June 15.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Number of calms.	Rainfall or melted snow.			Washington time.						Number of days—						Remarks.					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Total amount.	Any 2 con- secutive 8 hourly meas- ure- ments.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
											Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								
1883.																														
Jan.	20	4	7	8	18	3	10	18	5	9.85	2.43	4	4	6.2	6.8	5.3	6.1	35.3	85.6	70.4	73.9	73.3	7	12	16	1	10	0		
Feb.	30	4	7	11	12	7	8	6	4	8.41	2.43	23	24	7.5	6.6	5.6	6.6	40.1	84.2	63.9	73.5	73.9	4	11	13	0	7	0		
Mar.	28	4	5	5	24	7	7	8	7	8.02	1.06	6	7	5.4	5.4	4.9	5.1	37.4	72.0	49.1	63.5	61.2	11	9	11	0	0	0		
Apr.	24	3	6	8	20	10	8	4	5	7.71	2.10	6	7	6.2	5.8	4.0	5.4	33.7	88.9	60.5	73.5	72.6	7	13	10	0	0	0		
May.	20	4	4	12	20	5	12	1	5	4.83	1.64	9	10	4.1	5.2	2.8	4.0	33.8	70.6	53.4	70.2	68.4	10	18	8	0	0	0		
June.	3	2	2	7	17	5	1	0	8	3.78	1.20	13	13	5.5	4.9	2.1	4.2	27.0	84.4	60.0	73.3	74.8	6	1	7	0	0	0		
July.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Aug.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Sept.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Oct.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Nov.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Dec.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Sums.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Means.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.13 a. m., 2.13 p. m., and 10.13 p. m., local time. Corrections for instrumental errors of barometer used: From 6.13 a. m., January 1, to 10.13 p. m., April 30, inclusive, + .028 inch; from 6.13 a. m., May 1, to 10.13 p. m., June 15, inclusive, — .004 inch.

15, inclusive. — .004 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.500; February, 0.500; March, 0.400; April, 0.480; May, 0.470; June, 0.470.

CHARLES DILL,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76. — *Meteorological summary for the year ending December 31, 1883—Continued.*

STOCKTON, FORT, TEX.

[Latitude, 30° 58' N.; longitude, 102° 53' W. Magnetic variation, 10° 45' E. Elevation of barometer above sea-level, 3,010 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground,  $\frac{1}{4}$  foot.]

Month.	Barometer (corrected for temperature and instrumental error only).						Temperature.						Wind.					
	Washington time.			Washington time.			Self-registering thermometers.			Washington time.			Washington time.			Maximum hourly velocity during month.		
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	11 p. m.	3 p. m.	Maximum.	Date.	Minimum.	Date.	Δ between range.	Mean maximum.	Mean minimum.	11 p. m. to 7 p. m.	7 p. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.
1883.																		
Jan	27.067	27.087	27.045	27.050	27.412	27.046	18	31	6	21	74	68.5	23.0	1.717	1.884	2.042	5.743	26
Feb	27.100	27.079	27.089	27.063	27.574	27.038	15	15	8	4	74	61.1	32.5	1.797	1.885	2.485	6.167	37
Mar	28.068	28.071	28.088	28.065	27.387	27.013	30	15	28	19	60	70.7	41.3	1.977	1.991	2.673	6.541	40
Apr	28.910	28.886	28.887	28.864	27.418	27.438	30	28	31	15	61	75.1	45.1	1.959	2.734	3.200	7.933	44
May	28.948	28.928	28.918	28.931	27.227	28.26	41	28	45	10	53	86.5	66.7	2.262	2.422	2.867	7.571	39
June	28.961	28.931	28.934	28.942	27.106	29.38	68	3	45	18	80	40	95	2.577	2.359	3.064	7.643	35
July	27.028	27.011	27.002	27.014	27.218	18.28	82	11	60	23	43	92.4	63.8	2.190	2.337	3.438	8.352	32
Aug	27.060	27.029	27.040	27.043	27.108	28.28	87	13	54	30	44	94.2	63.0	1.969	1.639	2.768	5.978	32
Sept	27.086	27.048	27.067	27.065	27.321	21.28	81	20	40	23	53	82.5	67.1	1.961	1.747	2.840	5.948	48
Oct	27.008	28.962	28.991	28.967	27.376	31.28	67	27	34	20	53	77.1	58.3	1.762	1.710	2.543	6.128	40
Nov	27.069	27.068	27.075	27.077	27.471	12.28	60	9	24	27	63	67.2	40.2	1.945	1.945	1.117	2.835	24
Dec	27.100	27.059	27.104	27.068	27.541	14.20	80	22	16	9	64	62.6	38.7	976	1.187	1.890	3,553	31
Sums	324,869	322,998	324,149	324,169	.....	622,987	6728	8747.7	.....	.....	.....	626,582.2	.....	21,202	23,010	29,867	74,079	.....
Means	27.080	27.000	27.012	27.014	27.574	26.28	103	14	6	.....	.....	77.2	48.5	1,700.9	1,917.9	2,488.9	.....	.....

\* February.

† April.

‡ July.

§ January.

B. — Elevation determined by barometer.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.16 a. m., 1.16 p. m., and 9.16 p. m., local time. Correction for instrumental error of barometer used: From 5.16 a. m., January 1, to 9.16 p. m., December 31, inclusive,  $-.029$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.140; February, 3.130; March, 3.080; April, 3.080; May, 3.010; June, 2.920; July, 2.940; August, 2.940; September, 2.900; October, 3.030; November, 3.120; December, 3.140.

J. W. BYRAM,  
Private, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## TATOOSE ISLAND, WASH. T.

[Latitude, 49° 29' N.; longitude, 124° 44' W. Magnetic variation, 28° E. Elevation of barometer above sea-level, 86 feet. Elevation of thermometers above ground: exposed, 5 feet; maximum, 6 feet; minimum, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Mean maximum.	Mean minimum.	Washington time.				Miles.	Direction from —	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 a. m.	8 p. m.	11 p. m.							7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.			Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
1883.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</

Station opened October 1, 1883.

[illegible]

**Station opened October 1, 1883.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 2.49 a. m., 11.49 a. m., and 7.49 p. m., local time. Corrections for instrumental error of barometer used: From 3.49 a. m., October 1, to 7.49 p. m., December 31, inclusive, + .009 inch. Constants not recorded.

P. CONNOR,  
*Private, Signal Corps, U. S. A.*

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

THOMAS, FORT, ARIZ.

[Latitude, 23° 4' N.; longitude, 110° 2' W. Magnetic variation, 13° E. Elevation of barometer above sea-level, 2,710 (B) feet. Elevation of exposed thermometer above ground, 3 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.										Wind. <sup>1</sup>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Washington time.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.							Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

<sup>1</sup> No anemometer in use.<sup>2</sup> Barometer unserviceable from 7 a. m., June 19, to 7 a. m., October 13, 1883.

B.—Elevation determined by barometer.

\* June.

† January.

Month.	Winds at 7 a. m. and 11 p. m. Washington time: Num- ber of times observed blow- ing from—								Rainfall or melted snow.		Washington time.												Number of days—					Remarks.		
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 con- secutive hours measur- ments.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.		Maximum above 90°.	
									Largest amount.	Date.		7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.									11 p. m.
1883.																														
Jan.....	6	1	1	9	0	6	7	10	44	1.23	68	3.4	2.9	27.0	31.6	32.8	30.5	81.5	54.2	76.0	0	22	0	0	22	0	0	0		
Feb.....	2	4	14	4	4	4	8	6	36	1.54	67	30.31	4.4	43.9	32.6	34.5	40.6	64.5	44.3	63.7	0	0	0	0	0	0	0	0		
Mar.....	3	0	6	4	4	1	10	4	59	1.83	91	2.3	3.2	33.9	43.9	42.8	39.7	61.7	45.3	61.7	0	0	0	0	0	0	0	0		
Apr.....	3	0	0	10	6	3	19	5	50	0	0	0	1.7	32.3	30.3	30.8	68.3	32.5	31.7	41.3	0	0	0	0	0	0	0	0		
May.....	3	1	3	8	5	10	17	11	23	70	77	16	2.2	32.3	35.4	35.9	54.3	10.7	31.5	32.7	0	0	0	0	0	0	0	12		
June.....	6	1	3	4	0	10	11	19	41	0	0	0	1.3	43.6	43.1	43.1	47.2	14.9	34.7	34.7	0	0	0	0	0	0	0	29		
July.....	15	3	5	17	5	2	8	28	7	1.85	68	59	4.0	33.8	34.7	35.7	54.7	27.1	34.1	43.5	0	0	0	0	0	0	0	29		
Aug.....	1	0	7	24	13	7	16	18	7	2.69	169	19	2.9	67.6	57.3	61.0	59.9	73.1	31.3	54.1	15	0	0	0	0	0	0	30		
Sept.....	0	1	6	26	15	1	14	3	14	(*)	27	16	2.1	42.1	49.3	47.4	46.4	51.5	27.3	36.2	0	0	0	0	0	0	0	16		
Oct.....	0	1	6	20	9	9	27	4	17	52	20	19	2.0	33.3	38.1	39.5	33.3	44.3	29.9	49.7	41.3	0	0	0	0	0	0	0		
Nov.....	3	1	7	15	26	5	3	24	0	1.6	20	9	1.6	24.5	35.8	32.0	30.8	67.1	39.7	54.7	58.8	0	0	0	0	19	0	0		
Dec.....	0	0	10	10	11	0	9	45	1.07	34	4	0	3.9	40.0	32.7	33.9	35.3	82.7	54.7	72.5	70.0	0	0	0	0	16	0	0		
Sums ..	50	13	78	162	101	48	150	120	373	10.85	.....	.....	31.9	37.5	331.4	333.6	343.2	280.0	1417.1	614.4	610.4	205	137	23	55	0	72	115		
												Percentages.																		
Means ..	4.6	1.2	7.1	14.8	9.2	4.4	13.7	11.0	34.1	.....	.....	.....	2.7	3.1	2.6	2.8	37.7	40.4	41.4	38.8	66.7	34.8	51.2	50.9	56.2	37.5	6.3	15.1	0.19	731.5

\* Inappreciable.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.49 a. m., 12.49 p. m., and 8.49 p. m., local time.

Corrections for instrumental errors of barometer used: From 4.49 a. m., January 1, to 4.49 a. m., June 19, inclusive, +.019 inch; from 4.49 a. m., October 12, to 8.49 p. m., December 31, inclusive, +.014 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.890; February, 2.890; March, 2.780; April, 2.730; May, 2.670; June, 2.630; October, 2.710; November, 2.840; December, 2.890.

ROBT. C. LORD,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

TOLEDO, OHIO.

[Latitude, 41° 40' N.; longitude, 83° 34' W. Magnetic variation, 10 15' E. Elevation of barometer above sea-level, 451 feet. Elevation of exposed thermometer above ground, 65 feet. Elevation of rain-gauge above ground, 106 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.									
Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.				Washington time.				Maximum hourly velocity during month.						
7 a. m.	3 p. m.	11 p. m.	Hi.	Low.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Abnormal range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.	Direction.	Date.
1883.																								
Jan.	29.419	29.380	29.418	29.406	29.344	29.106	19.3	25.9	21.6	22.3	24.9	20	9.0	22	58.0	29.1	13.0	2.343	2.339	2.458	7.140	38	SW.	13
Feb.	29.518	29.483	29.495	29.499	29.422	29.072	24.7	31.6	28.6	28.3	30.0	16	7.0	20	67.0	35.8	20.5	1.991	2.224	2.131	6.316	32	NE.	25
Mar.	29.511	29.483	29.495	29.486	29.472	29.063	27.1	34.1	31.6	31.9	33.0	14	20.5	20	67.0	41.9	22.5	2.201	2.890	2.850	8.011	43	NE.	28
Apr.	29.519	29.444	29.468	29.463	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
May.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
June.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
July.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
Aug.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
Sept.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
Oct.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
Nov.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
Dec.	29.524	29.463	29.486	29.483	29.456	29.043	25.5	32.5	29.5	29.7	30.0	14	20.5	21	67.0	38.0	22.5	2.302	2.285	2.067	7.214	43	W.	11
Suma.	352.230	351.797	352.072	352.035	352.035	352.035	542.2	644.4	575.1	587.2	587.2	.....	.....	.....	.....	680.2	486.5	23.572	31.292	27.357	82.221	.....	.....	.....
Means.	29.511	29.483	29.495	29.499	29.422	29.063	45.2	53.7	47.9	48.9	48.9	34	9.0	22	.....	58.7	40.5	1.994	2.605	2.285	.....	.....	.....	.....
										October.					January.									

\* February.

† July.

† October.

\* February.

\* February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.			Washington time.								Number of days—					Remarks				
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.		.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.
												7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.								
1883.																													
Jan....	6	14	4	10	25	10	8	4	1.77	17	7.2	6.2	6.3	6.6	12.0	15.5	14.7	14.4	76.0	65.1	74.7	71.9	9	11	14	15	16	29	0
Feb....	5	7	11	11	4	20	6	4	2.26	3	6.9	7.6	6.7	7.1	17.9	19.9	19.8	19.2	74.9	61.7	69.8	65.8	2	11	15	11	10	28	0
Mar....	4	11	11	2	13	27	15	0	1.78	61	18.19	6.0	5.0	5.7	15.7	17.5	19.1	17.4	62.2	48.6	58.8	55.8	2	11	15	11	10	26	0
Apr....	10	9	20	2	9	13	6	0	1.57	1	5.7	6.4	4.2	5.1	31.5	32.6	33.6	32.6	61.7	48.7	61.5	58.3	6	16	8	10	4	26	0
May....	19	8	5	19	9	16	4	0	5.69	1.29	14	18	6.1	6.5	42.3	43.7	43.3	43.1	70.2	55.0	69.3	64.9	6	16	8	10	4	26	0
June....	3	6	7	5	25	19	4	2	2.99	7.73	6	6.2	7.5	5.0	38.7	38.4	39.1	38.4	74.2	58.2	74.6	69.0	8	17	14	15	10	0	0
July....	9	3	4	2	19	36	17	2	4.26	1.39	20	21	6.4	6.7	58.1	60.9	61.8	61.3	73.4	54.7	72.7	66.9	7	19	5	9	0	0	2
Aug....	17	12	9	8	18	13	12	2	1.51	61	25	4.1	4.6	2.7	55.9	54.2	57.5	55.9	74.5	48.7	70.8	64.7	14	11	6	7	0	0	0
Sept....	16	18	16	4	12	8	7	2	2.78	86	16	4.7	5.3	4.4	49.0	50.3	51.1	50.1	78.4	58.4	73.8	70.2	10	17	11	11	0	0	0
Oct....	25	7	22	6	15	9	2	0	3.68	78	23	7.1	8.3	7.0	75.4	41.7	41.6	41.6	77.1	61.4	70.8	60.8	2	12	17	15	0	0	0
Nov....	8	4	4	1	27	14	23	0	3.03	1.30	21	6.4	5.3	6.0	82.0	31.7	31.3	31.7	70.3	54.4	62.7	62.8	5	7	15	10	1	21	0
Dec....	9	2	6	2	15	13	14	0	1.90	.48	23	7.2	5.6	6.7	83.7	24.5	24.4	24.2	76.8	64.2	72.4	71.5	8	12	14	13	9	8	0
Sums..	131	101	123	30	182	205	208	93	184.24	.....	71.5	60.4	60.6	60.6	944.1	240.9	345.7	344.9	872.8	577.1	583.9	579.7	78	153	194	136	40	114	3
	Percentages.																												
Means.	12.0	9.3	11.2	3.0	6.1	6.1	7.9	0.8	0.6	0.7	5.0	5.9	5.9	5.9	36.8	37.6	38.1	37.5	72.7	58.4	69.5	66.2	23.1	44.1	938.7	37.3	11.0	31.2	06

Notes.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.34 a. m., 2.34 p. m., and 10.34 p. m., local time. Correction for instrumental error of barometer used: From 6.34 a. m., January 1, to 10.34 p. m., December 31, inclusive, —.012 inch. The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.730; April, 0.710; May, 0.680; June, 0.680; July, 0.670; August, 0.670; September, 0.680; October, 0.700; November, 0.730; December, 0.740.

ALLEN BUELL,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 70.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## TUCSON, ARIZ.

[Latitude, 32° 14' N.; longitude, 110° 53' W. Magnetic variation, 13° E. Elevation of barometer above sea-level, 2,300 feet. Elevation of exposed thermometer above ground,<sup>1</sup> 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.								
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.					Washington time.				Maximum hourly velocity during month.			
	7 a. m.	3 p. m.	11 p. m.						Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	Total.	Miles.				
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Direction from—	Date.			
1883.																								
Jan.	27.63	27.63	27.64	27.64	27.61	8	27.358	19	.594	36.57	54.8	46.8	71	23	31	18	21	53	61.3	34.0	18	W.		
Feb.	27.59	27.59	27.60	27.56	28.046	17	27.256	2	.700	43.360	751.9	52.0	76	1	23	4	53	53	64.5	89.8	18	E.		
Mar.	27.55	27.54	27.54	27.54	27.724	1	27.390	22	.364	50.670	860.2	60.5	87	26	41	20	23	46	74.0	47.5	24	E.		
Apr.	27.48	27.48	27.48	27.57	27.874	15	27.202	23	.672	48.476	264.2	62.9	92	16	32	15	60	81.2	45.7	769	1,057	1,582	3,408	
May.	27.50	27.47	27.49	27.43	27.672	19	27.340	16	.332	55.385	272.0	70.8	105	27	44	9	5	61	90.9	52.7	631	1,075	1,509	3,215
June	27.47	27.44	27.42	27.44	27.600	2	27.261	8	.339	64.296	632.8	81.2	107	4	55	2	53	101.8	61.8	297	358	716	1,399	14
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								
Sums																								
Means																								
	Average.																							

<sup>1</sup> One 7 a. m. observation missed.

\* Station closed June 15.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 con- secutive 3 hourly measure- ments.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.		
											Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.									11 p. m.	Mean.
1883.																																
Jan.	3	3	6	24	25	6	6	16	41.27	.84	3	2.8	2.6	2.5	2.025	73.0	38.4	63.5	59.3			17	11	3	6	0	11	0				
Feb.	3	1	21	11	19	3	7	12	6.51	.33	12	3.3	2.7	3.3	4.131	66.6	37.0	52.6	52.1			12	10	5	6	0	6	0				
Mar.	2	0	12	20	12	6	14	13	13.14	.49	3	3.3	2.6	4.5	4.538	76.1	35.8	56.3	56.1			8	18	5	6	0	0	0				
Apr.	2	1	6	14	15	17	18	13	4 (1)	(1)	4	0.9	2.0	1.2	1.425	51.4	16.4	23.5	22.4			26	4	0	0	0	0	1				
May	1	0	8	13	21	18	11	11	10.35	.85	16	1.5	1.9	1.1	1.534	47.2	17.1	28.0	20.8			24	6	1	1	0	0	17				
June	0	0	8	5	7	9	12	3	6.00	.00		0.3	0.8	0.2	0.440	38.8	14.1	24.3	27.0			14	1	6	0	0	0	15				
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Inappreciable.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.44 a. m., 12.44 p. m., and 8.44 p. m., local time.  
 Correction for instrumental error of barometer used: From 4.44 a. m., January 1, 1883, to 8.44 p. m., June 15, 1883, inclusive, +.012 inch.  
 The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 2.500; February, 2.480; March, 2.460;  
 April, 2.380; May, 2.340; June, 2.300.

J. L. WHITESIDE,  
*Private, Signal Corps, U. S. A.*



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

## UNALASHKA, ALASKA.

[Latitude, 53° 53' N.; longitude, 160° 32' W. Magnetic variation, 18° 53' E. Elevation of barometer above sea level, 13 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).						Temperature.						Wind.						Maximum hourly velocity during month—	Direction from—	Date.																					
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometer.			Washington time.			Wabington time.																										
	7 p. m.	3 p. m.	11 p. m.	In.	Th.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Absolute range.	Date.	Maximum.	Minimum.	7 a. m.	3 p. m.				11 p. m.	Total.	Miles.																		
1883.																																										
Jan. 1	29.340	29.364	29.364	29.340	29.364	29.340	29.340	34.4	34.7	34.1	34.1	34.1	34.1	34.4	34.7	34.1	34.1	34.4	34.7	34.1	34.1	SE.	22																			
Feb. 1	30.266	30.249	30.249	30.266	30.249	30.266	30.266	30.9	31.6	31.6	31.6	31.6	31.6	30.9	31.6	31.6	31.6	30.9	31.6	31.6	31.6	N. NW.	15																			
Mar. 1	29.635	29.633	29.633	29.635	29.633	29.635	29.635	30.0	31.3	31.3	31.3	31.3	31.3	30.0	31.3	31.3	31.3	30.0	31.3	31.3	31.3	SE.	24																			
Apr. 1	29.810	29.728	29.721	29.728	29.721	29.810	29.810	33.4	33.8	33.8	33.8	33.8	33.8	33.4	33.8	33.8	33.8	33.4	33.8	33.8	33.8	SW. W.	27																			
May 1	29.541	29.531	29.526	29.541	29.531	29.541	29.541	40.8	41.5	41.5	41.5	41.5	41.5	40.8	41.5	41.5	41.5	40.8	41.5	41.5	41.5	SE.	20																			
June 1	29.390	29.341	29.341	29.390	29.341	29.390	29.390	46.8	47.4	47.4	47.4	47.4	47.4	46.8	47.4	47.4	47.4	46.8	47.4	47.4	47.4	SE. W.	20																			
July 1	29.086	29.080	29.080	29.086	29.080	29.086	29.086	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	SE. W.	21																			
Aug. 1	29.085	29.060	29.060	29.085	29.060	29.085	29.085	51.5	52.0	52.0	52.0	52.0	52.0	51.5	52.0	52.0	52.0	51.5	52.0	52.0	52.0	SE.	29																			
Sept. 1	29.631	29.617	29.617	29.631	29.617	29.631	29.631	44.6	45.8	45.8	45.8	45.8	45.8	44.6	45.8	45.8	45.8	44.6	45.8	45.8	45.8	SE.	31																			
Oct. 1	29.818	29.814	29.814	29.818	29.814	29.818	29.818	44.0	43.7	43.7	43.7	43.7	43.7	44.0	43.7	43.7	43.7	44.0	43.7	43.7	43.7	NW.	14																			
Nov. 1	29.838	29.844	29.844	29.838	29.844	29.838	29.838	36.8	36.1	36.1	36.1	36.1	36.1	36.8	36.1	36.1	36.1	36.8	36.1	36.1	36.1	W.	1																			
Dec. 1	29.634	29.634	29.637	29.634	29.634	29.634	29.634	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	SE.	30																			
Sums.	337,419	337,390	337,390	337,419	337,390	337,419	337,419	476.2	480.8	480.8	480.8	480.8	480.8	476.2	480.8	480.8	480.8	476.2	480.8	480.8	480.8	SE.	30																			
Means.	29.785	29.788	29.788	29.785	29.788	29.785	29.785	39.7	40.1	40.1	40.1	40.1	40.1	39.7	40.1	40.1	40.1	39.7	40.1	40.1	40.1	SE.	30																			
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1 Only two observations taken daily. 2 January. 3 July. 4 February. 5 March. 6 Five 7 a. m. observations missed.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.				Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Largest amount.	Date.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 1.02 a. m., 9.02 a. m., and 5.02 p. m., local time.

Correction for instrumental error of barometer used: From 1.02 a. m., January 1, to 5.02 p. m., December 31, inclusive, —.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.02; February, 0.02; March, 0.02; April, 0.02; May, 0.02; June, 0.01; July, 0.01; August, 0.01; September, 0.01; October, 0.02; November, 0.02; December, 0.02.

SAML. APPELGATE,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

VICKSBURG, MISS.

[Latitude, 32° 22' N.; longitude, 90° 53' W. Magnetic variation, 7° E. Elevation of barometer above sea-level, 244 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer (corrected for temperature and instru- mental error only).										Temperature.										Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.			Monthly mean.			Highest.		Lowest.		Range.		Washington time.			Self-registering ther- mometers.				Mean maximum.			Mean minimum.			Washington time.				Total.		Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 a. m.	3 p. m.	11 p. m.	In.	Ja.	In.	Date.	Lowest.	Ja.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Miles.	Total.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

† July.

† April.

! One 7 a. m. observation missed.

\* February.

Month.	Wind at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Rainfall or melted snow.		Washington time.						Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	Cloudy.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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One 7 a. m. observation missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time. Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m., December 31, inclusive,  $-.008$  inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.270; April, 0.260; May, 0.250; June, 0.250; July, 0.240; August, 0.240; September, 0.230; October, 0.230; November, 0.270; December, 0.270.

JAMES KENEALY,  
Beyersant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

WASHAKIE, FORT, WYO.

[Latitude, 43° 1' N.; longitude, 108° 54' W. Magnetic variation, 17° E. Elevation of barometer above sea-level, 5,580 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.								Wind.					Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.				Washington time.			Washington time.			Total.	Miles.	Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	High.	Low.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.						Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
1883.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

Station closed June 15.

B.—Elevation determined by barometer.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Total amount.	Any 3 consecutive hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).			Clear.	Cloudy.	.01 inch or more of water.	Maximum below 330.		Minimum below 330.	Maximum above 90°.		
											7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								11 p. m.	Mean.
1888.									In.	Date.																		
Jan.....	3	7	7	11	9	6	28	14	.83	31	3.6	0.2	2.0	3.9	6.6	10.9	6.6	18.0	75.9	60.0	72.4	102.4	1019	2	61593	0		
Feb.....	1	4	13	9	7	4	29	512	.05	32	1.8	4.2	2.5	2.8	15.9	27.0	19.4	20.8	79.5	49.3	64.5	64.4	1414	3	5	030	0	
Mar.....	4	6	11	19	9	8	28	8	.35	13	2.4	4.4	2.7	3.2	23.4	37.0	27.2	26.5	76.6	52.1	70.0	66.2	712	11	11	023	0	
Apr.....	1	7	8	14	11	6	19	19	3.32	23	5.0	7.1	5.3	5.8	33.0	37.6	38.7	35.8	47.8	84.5	71.4	67.9	819	9	10	0	7	
May.....	6	12	3	17	5	20	16	13	3.57	1	8.9	5.3	7.1	5.0	5.8	33.0	37.6	38.7	35.8	47.8	84.5	71.4	67.9	819	9	10	0	7
June.....	0	3	6	7	1	11	7	8	1.07	41	6.2	0.7	3.7	5.5	38.1	40.9	40.2	39.7	85.1	43.3	72.4	67.9	210	3	9	0	0	
July.....																												
Aug.....																												
Sept.....																												
Oct.....																												
Nov.....																												
Dec.....																												
Sums.....																												
Means.....																												

<sup>1</sup> Four 7 a. m., four 11 p. m., observations missed. <sup>2</sup> Eight 7 a. m., six 11 p. m., observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.52 a. m., 12.52 p. m., and 8.52 p. m., local time.

Correction for instrumental error of barometer used: From 4.52 a. m., January 1, to 8.52 p. m., June 15, inclusive, + .004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.790; February, 5.760; March, 5.720; April, 5.560; May, 5.480; June, 5.380.

T. M. AMBLER,  
Private, Signal Corps, U. S. A.

**APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.***

WASHINGTON, D. C.

[Latitude, 38° 54' N.; longitude, 77° 2' W. Magnetic variation, 3° W. Elevation of barometer above sea-level, 106 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 51 feet.]

Month	Barometer (corrected for temperature and instrumental error only).						Temperature.						Wind.											
	Washington time.			Monthly mean.	Highest.	Date.	Washington time.			Self-registering thermometers.			Washington time.			Total.	Miles.	Direction from—	Maximum hourly velocity during month.					
	7 a.m.	3 p.m.	11 p.m.				7 a.m.	3 p.m.	11 p.m.	Month mean.	Maximum.	Date.	Absolute range.	Mean maximum.	Mean minimum.					11 p.m. to 7 a.m.	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.		
1883.																								
Jan	30.115	30.071	30.118	30.101	30.543	W	24.30	51.7	10.1	69.8	W	27.3	28.2	28.3	28.6	50.4	8	18.95	11.03	1883	22.677	21	N.W.	21
Feb	30.105	30.101	30.130	30.123	30.471	W	23.68	52.8	11.018	74.1	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Mar	30.045	29.872	30.021	29.996	30.471	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Apr	30.045	29.872	30.021	29.996	30.471	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
May	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
June	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
July	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Aug	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Sept	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Oct	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Nov	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Dec	30.011	29.835	29.875	29.875	30.383	W	23.68	52.8	11.170	81.0	W	27.1	41.0	40.6	37.5	50.5	5	8.10	31.236	1883	73.230	22	S.	3
Sums	300.228	336.520	360.010	359.920	.....	.....	594.	4730.	6321.	6	648.6	.....	761.7	544.7	9.601	16.437	12.360	38.684	.....	.....	.....	.....	.....	.....
Means	30.019	29.940	30.001	29.993	30.677	.....	49.5	60.8	51.8	54.0	57.1	77.9	63.5	45.4	800.11	360.8	1,047.4	.....	.....	.....	.....	.....	.....	.....

1 Self-register lost 2 miles.

2 By dial.

3 Self-register lost 28 miles.

4 Self-register lost 45 miles.

5 February.

6 May.

7 July.

**Self-register lost 2 miles.**

**By dial.**

**Self-register lost 28 miles.**

**Self-register lost 45 miles.**

**February.**

**May.**

**July.**

**5 January.**

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.	Washington time.						Number of days—					Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Number of calms.	Total amount.	Any 3 con- secutive 8 hourly measure- ments.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Partly.	Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
												Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.		Mean.	7 a. m.								3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Note.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond with 7 a. m., 3 p. m., and 11 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, + .002 inch.

The barometric observations have been reduced to sea-level by adding the following constants for the various months: January, 0.120; February, 0.120; March, 0.120; April, 0.120; May, 0.110; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

T. R. HARRISON,  
Sergeant, Signal Corps, U. S. A.



APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

WEST LAS ANIMAS, COLO.

[Latitude, 38° 4' N.; longitude, 103° 12' W. Magnetic variation, 13° 9' E. Elevation of barometer above sea-level, 3,899 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 7 feet.]

Barometer (corrected for temperature and instru- mental error only).										Temperature.						Wind.																	
Washington time.			Monthly mean.			Highest.			Lowest.			Date.			Range.			Washington time.				Self-registering ther- mometers.				Washington time.				Wind.			
7 p. m.	3 p. m.	11 p. m.	<i>T<sub>w</sub></i>	<i>T<sub>m</sub></i>	<i>T<sub>n</sub></i>	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	8 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Date.					
25.034	25.070	25.065	25.013	25.309	25.035	25.464	12	1.509	10.9	24.1	23.9	18.8	20.4	61.5	24	21.5	19	20	53.0	39.1	4.4	1.754	1.753	2.040	0.547	46	N.	29					
25.134	25.079	25.128	25.114	25.035	17.235	238	15	1.339	27.1	24.2	21.7	21.7	22.2	64.0	28	22.5	10	19	64.5	40.1	7.0	1.572	1.753	2.040	0.547	44	NW.	15					
25.051	25.012	25.029	25.031	25.008	25.235	238	30	0.962	37.8	35.8	34.1	40.5	40.5	74.5	30	22	10	19	64.5	39.8	24.2	1.572	1.753	2.040	0.547	44	NW.	18					
25.802	25.841	25.864	25.860	25.496	24.335	21	1.561	35.8	27.1	64.2	49.8	49.8	40.5	82.5	17	18	10	2	63.5	66.8	33.4	2.176	2.658	3.474	0.117	38	NW.	22					
25.967	25.904	25.949	25.940	25.312	20.257	17	1.025	71.8	47.3	71.8	65.2	66.1	66.1	91.0	31	30.5	21	4	69.5	70.5	44.7	2.526	2.898	3.826	0.247	42	N.	8					
25.047	25.005	25.018	25.023	24.957	25.074	11	0.563	38.2	38.2	80.8	63.3	63.3	60.2	98.5	22	40.5	19	13	68.0	83.9	55.0	1.946	1.946	2.840	0.432	42	N.	6					
25.082	25.031	25.019	25.064	25.296	27.255	798	15	0.500	63.8	80.5	75.9	72.3	72.3	104.0	29	53.5	19	18	84.5	88.7	61.7	1.922	1.922	2.832	0.508	36	NW.	13					
25.137	25.108	25.129	25.131	25.554	20.255	848	21	0.465	61.6	85.5	75.4	76.2	76.2	99.5	29	52.0	29	23	84.5	89.3	60.6	1.950	1.959	2.454	0.538	32	N.	23					
25.015	25.063	25.018	25.068	25.507	20.255	780	13	0.774	89.1	77.6	61.5	61.5	61.5	97.5	7	35.0	25	25	92.5	81.1	49.1	1.928	1.937	2.538	0.503	44	N.	13					
25.019	25.063	25.018	25.068	25.507	20.255	587	17	0.940	89.1	61.2	48.0	48.0	48.0	86.5	7	18.0	25	25	97.5	85.5	38.0	1.895	2.170	2.891	0.098	30	NW.	28					
25.061	25.065	25.024	25.027	25.550	11.255	587	25	0.963	25.2	58.8	85.9	85.9	85.9	77.0	2	4.0	2	26	98.0	61.2	21.7	1.322	1.480	1.755	0.407	36	N.	5					
25.049	25.025	25.074	25.049	25.567	14.255	544	6	1.023	24.2	43.6	32.7	32.7	32.7	68.0	2	2.5	2	31	70.5	48.9	20.6	1.322	1.381	1.900	0.585	49	NW.	6					
312.628	312.037	312.427	312.966	312.966	453.6	751.7	579.0	594.6	453.6	751.7	579.0	594.6	594.6	594.6	594.6	594.6	594.6	594.6	594.6	594.6	21.446	24.490	32.051	71.989	71.989	71.989	71.989	71.989	71.989				
25.053	25.003	25.036	25.030	25.035	17.24	923	121	37.8	37.8	62.6	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8				

\* February.

† April.

‡ July.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.				Number of days—					Remarks.						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.		Cloudiness (in tenths).		Dew-point.		Relative humidity (per cent.).			Clear.		Fair.	Cloudy.	.01 inch or more of water.			
										Largest amount.	Date.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.					Mean.	7 a. m.	3 p. m.	11 p. m.
1883.																										
Jan.....	16	5	18	2	3	12	20	13	4	1.14	31	3.5	4.5	4.2	3	79.9	44.5	64.8	63.7	12	8	9	21	0		
Feb.....	14	12	14	3	4	7	16	12	2	.52	24	2.3	3.8	2.3	18.3	79.5	46.2	68.0	64.6	19	4	9	27	0		
Mar.....	8	17	27	3	7	1	20	1	9	.15	19	4.2	4.8	3.5	4.2	69.8	28.8	47.0	48.5	17	1	0	28	0		
Apr.....	11	10	9	7	8	10	21	9	5	.83	14	5.7	5.9	4.1	22.9	72.4	25.4	43.5	44.3	2	3	0	12	0		
May.....	13	6	19	8	12	12	10	6	1	1.50	65	2.9	4.6	5.2	24.8	70.6	22.5	44.8	48.0	9	9	0	1	2		
June.....	8	9	24	15	6	5	14	6	1	2.63	8	2.3	2.5	3.2	38.9	72.4	20.8	49.7	50.6	15	12	0	0	12		
July.....	13	8	18	6	14	11	18	5	0	.67	29	4.5	5.8	5.4	40.4	61.5	20.8	41.6	41.3	9	6	0	0	22		
Aug.....	6	10	27	8	9	7	13	7	7	.65	28	2.8	3.9	4.6	41.1	79.2	32.3	52.7	54.7	11	15	0	0	17		
Sept.....	12	10	19	9	6	10	12	9	3	1.35	56	4.5	4.0	3.4	39.5	76.2	23.0	56.5	53.6	14	12	0	0	1		
Oct.....	7	16	20	10	6	9	17	8	0	.69	64	4.4	3.2	3.7	34.2	78.9	24.6	62.6	63.7	16	9	0	0	10		
Nov.....	7	13	9	8	11	7	28	7	0	.21	17	1.8	2.2	1.6	19.9	82.3	20.8	45.6	47.8	19	11	0	3	27		
Dec.....	9	9	12	2	5	9	33	10	4	1.66	1	4.5	5.0	4.0	20.3	82.3	45.3	72.1	66.6	8	17	3	30	0		
Sums ..	124	124	216	81	93	100	224	97	36	11.12	.....	46.9	52.0	44.5	353.4	888.4	379.0	653.9	640.4	146	197	62	21	106	54	
Means ..	11.1	11.1	18.7	7.7	8.3	9.6	19.0	8.3	3.3	.....	.....	3.9	4.3	3.8	29.4	74.0	31.6	54.5	53.4	40.9	43.0	0.17	0.18	9.5	8.45	514.8

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond with 5.15 a. m., 1.15 p. m., and 9.15 p. m., local time.

Corrections for instrumental errors of barometer used: From 5.15 a. m., January 1, to 9.15 a. m., June 27, inclusive, +.002 inch; from 1.05 p. m., June 27, to 9.05 p. m., December 31, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.13; February, 4.12; March, 4.07; April, 3.96; May, 3.85; June, 3.77; July, 3.76; August, 3.74; September, 3.82; October, 3.93; November, 4.11; December, 4.15.

F. H. BRANDENBURG,  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

WILMINGTON, N. C.

[Latitude, 34° 14' N.; longitude, 77° 57' W. Magnetic variation, 15° W. Elevation of barometer above sea-level, 33 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 44 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Washington time.			Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering thermometers.			Mean maximum.			Mean minimum.			Washington time.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Mon. ly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

"January."

"September."

"July."

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—					Remarks.					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Total amount.	Any 3 consecutive 8 hourly measurements.	Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.		Cloudy.	.01 inch or more of water.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.
												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.								
1883.																													
Jan.....	16	18	7	7	11	10	7	16	1	6.33	1.65	7.8	7.2	40.2	42.6	40.7	41.2	87.3	84.3	81.3	8	13	15	16	0	5	0		
Feb.....	16	13	2	5	17	13	6	9	24	23	1.19	4.8	4.5	43.7	43.7	46.1	44.5	81.5	80.3	74.1	8	12	10	9	0	0	0		
Mar.....	14	8	11	5	7	24	11	12	1	5.78	1.34	4.6	5.1	33.2	33.2	33.2	33.2	73.2	72.0	67.8	9	16	9	12	0	2	0		
Apr.....	17	13	11	14	7	23	14	7	22	23	1.23	4.3	5.3	33.3	33.3	33.3	33.3	84.2	83.1	77.2	9	16	10	9	0	0	0		
May.....	14	18	7	7	14	33	12	6	19	20	1.37	4.0	5.7	33.3	33.3	33.3	33.3	74.2	73.5	68.3	12	14	5	17	0	0	0		
June.....	3	7	2	7	14	33	12	6	10	34	1.22	4.2	4.7	37.1	37.1	37.1	37.1	84.1	83.9	78.3	12	14	5	15	0	0	0		
July.....	10	34	9	15	13	27	13	4	5	71	0.82	4.0	4.3	37.1	37.1	37.1	37.1	82.9	82.0	74.9	11	14	4	11	0	0	14		
Aug.....	10	34	9	15	13	27	13	4	5	51	0.82	4.0	4.3	37.1	37.1	37.1	37.1	82.9	82.0	74.9	10	14	7	11	0	0	18		
Sept.....	9	18	8	10	6	19	4	5	11	16	0.57	3.9	4.0	36.5	36.5	36.1	35.8	87.1	87.1	82.4	6	13	11	14	0	0	0		
Oct.....	14	34	9	9	5	10	2	7	3	1	0.40	4.0	4.0	58.8	59.8	58.1	58.9	84.1	84.7	78.1	8	13	11	8	0	0	0		
Nov.....	17	15	7	7	8	16	6	11	6	4	0.20	3.7	3.4	44.5	43.8	43.2	44.5	78.4	50.5	71.7	8	15	7	8	0	2	0		
Dec.....	11	15	7	7	8	21	6	17	1	1	23	0.33	3.1	5.5	41.9	43.3	41.8	41.8	73.9	69.1	10	14	7	8	0	0	0		
Sums...	122	202	87	97	99	251	94	102	39	64.00	.....	67.375	2.46	6.63	5.860	5.860	5.860	5.860	99.1	89.5	99	168	100	128	0	10	27		
Means...	11.1	18.47	9.8	9.9	9.22	29.8	9.3	12.6	.....	.....	.....	5.6	6.3	2.9	5.3	54.3	55.0	55.4	54.9	81.9	61.8	80.1	74.6	27.145	3.74	35.1	0	37.4	
	Percentages.																												

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time. Correction for instrumental error of barometer used: From 6.56 a. m., January 1, to 10.56 p. m., December 31, inclusive, +.012 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.060; April, 0.060; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.060; December, 0.060.

L. H. ALBRECHT  
Sergeant, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

YANKTON, DAK.

[Latitude, 45° 54' N.; longitude, 97° 28' W. Magnetic variation, 12° 30' E. Elevation of barometer above sea level, 1,928 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 28 feet.]

Barometer (corrected for temperature and instrumental error only).										Temperature.					Wind.													
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.		Mean maximum.	Mean minimum.	Washington time.			Total.	Miles.	Direction.	Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.			Date.	Minimum.	Date.					Absolute range.	7 a. m. to 11 p. m.	3 p. m. to 7 p. m.	11 p. m. to 3 p. m.	
1883.																												
Jan.	28.618	28.708	28.842	28.618	29.223	3.28	109	12.1	114	2.6	12.1	4.5	7.4	44.5	20	22.0	19.06	0	19.06	0	1,081	1,743	1,921	5,343	52	N.W.	13	
Feb.	28.627	28.919	28.966	28.618	29.409	17.28	174	15.1	235	10.5	23.0	18.1	17.2	50.0	28	22.0	47.0	0	47.0	0	1,124	1,441	1,134	3,719	41	N.W.	16	
Mar.	28.760	28.737	28.771	28.773	29.409	23.06	171	22.8	24.5	23.0	33.7	24.5	23.5	70.0	17	4.0	19.06	0	19.06	0	1,440	2,090	2,187	5,726	37	N.W.	19	
Apr.	28.535	28.596	28.561	28.557	29.150	24.27	142	21.1	208	40.1	53.1	47.6	47.6	78.0	20	27.0	1,115	0	1,115	0	2,144	2,509	2,385	7,238	55	N.W.	14	
May	28.628	28.638	28.608	28.621	29.094	11.37	84	19.1	156	47.0	68.1	62.6	62.6	88.0	6	28.0	561	0	561	0	2,138	2,814	2,981	7,965	48	E. N.	13	
June	28.631	28.635	28.643	28.631	29.094	11.37	294	11.1	157	60.9	73.8	66.3	67.0	95.0	29	38.0	356	0	356	0	2,043	2,187	2,238	6,465	45	S.W.	15	
July	28.499	28.677	28.677	28.688	29.976	17.28	258	15.1	217	68.6	78.1	71.3	71.9	103.0	1	52.0	17,511	0	17,511	0	1,538	1,787	1,646	4,971	29	N.W.	26	
Aug.	28.760	28.749	28.728	28.746	29.976	5.28	226	21.1	217	68.6	70.5	71.3	70.0	92.0	21	48.0	33.4	0	33.4	0	1,079	1,013	1,094	4,026	35	N.W.	19	
Sept.	28.785	28.754	28.765	28.769	29.105	8.28	468	13.1	639	51.4	63.7	65.9	65.0	98.1	7	30.0	852	0	852	0	1,697	2,432	2,247	6,390	40	N.	21	
Oct.	28.748	28.725	28.750	28.744	29.223	20.28	169	17.1	637	40.8	52.7	45.0	44.0	81.2	7	31.0	20.90	1	20.90	1	1,693	2,334	2,293	6,322	28	N. SE.	21	
Nov.	28.738	28.688	28.713	28.733	29.818	28.38	222	25.0	1,096	37.0	45.0	32.3	34.1	66.8	2	2.6	15.94	2	15.94	2	1,716	2,497	2,227	6,440	30	N.	17	
Dec.	28.770	28.749	28.777	28.765	29.297	14.28	034	17.1	283	17.8	31.0	22.4	24.6	66.8	12	12.9	27.72	4	27.72	4	1,981	2,364	2,355	6,700	88	N.	25	
Sums.	344.837	344.903	344.754	344.763	.....	.....	.....	.....	.....	451.702	1,519.6	537.8	.....	.....	666.5420	9	21.246	28.220	25,818	73	290	.....	.....	.....	.....	.....	.....	.....
Means.	28.736	28.728	28.730	28.730	29.409	27.840	118	.....	.....	37.6	51.0	43.3	44.0	103.0	11	22.0	519	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

January.

July.

May.

February, March.

Nine 7 a. m., nine 3 p. m., nine 11 p. m. observations missed.

January.

July.

May.

February, March.

For 10 days.

Month.	Winds at 7 a. m., 9 and 11 p. m., Washington time: Number of times observed blowing from—								Rainfall or melted snow.		Washington time.								Number of days—						Remarks.			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Any 3 con- secutive 8 hourly measure- ments.		Cloudiness (in tenths).			Dew-point.			Relative humidity (per cent.).				Clear.	Fair.	(Cloudy. .01 inch or more of water.		Maximum below 32°.	Minimum below 32°.	Maximum above 32°.
										Total amount.	Date.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.							
1883.																												
Jan.	13	8	4	5	8	8	5	33	9	1.06	.23	7	7	4.8	4.7	3.2	3.4	64.5	64.8	64.8	61.4	7	19	5	14	24	31	0
Feb.	19	2	1	4	7	5	7	11	10	.73	.26	13	14	4.7	3.9	3.9	18.4	63.4	62.1	67.6	63.0	9	6	4	7	4	19	0
Mar.	20	15	9	8	8	5	8	13	10	1.42	.42	25	30	4.5	5.3	5.3	13.9	65.4	67.9	65.8	63.0	12	8	11	8	5	29	0
Apr.	16	13	9	8	8	5	8	13	10	5.71	2.43	22	23	5.3	6.3	6.3	34.9	64.6	60.4	62.7	59.2	7	20	3	12	0	1	0
May	14	8	8	9	11	5	11	13	8	8.76	2.89	13	14	4.7	6.0	5.2	38.0	72.9	64.7	72.1	67.6	8	11	12	15	0	1	0
June	10	13	11	9	5	14	11	11	9	4.40	1.85	1	2	4.2	4.4	1.5	3.4	55.6	56.7	55.7	68.7	15	14	1	19	0	0	3
July	7	5	11	11	14	13	18	9	5	3.33	.92	22	24	4.9	4.7	2.3	4.3	62.6	63.0	61.4	72.6	10	17	4	10	0	0	7
Aug.	22	7	9	9	16	9	6	11	1	2.85	1.95	13	14	3.2	3.5	3.3	56.4	62.5	63.8	60.9	77.8	15	11	6	8	0	0	2
Sept.	7	5	11	11	20	4	9	18	0	3.96	.07	21	21	4.4	3.9	2.7	43.8	48.4	48.7	48.0	70.5	12	16	2	6	0	0	0
Oct.	14	10	3	15	20	4	9	18	0	1.98	.54	17	18	6.5	6.4	4.0	5.9	38.6	37.1	38.0	37.2	6	16	9	12	0	5	0
Nov.	21	6	3	6	10	12	16	16	1	0.08	.08	5	5	2.5	4.3	2.0	2.9	23.2	23.9	23.0	23.0	17	12	1	1	3	25	0
Dec.	16	4	6	6	5	13	14	24	5	0.91	.51	6	6	4.2	5.1	4.2	13.2	78.9	55.5	73.5	69.3	12	13	6	5	11	28	0
Sums	181	92	87	100	120	101	116	191	90	35.21	.....	51	54	53.8	44.9	37.0	44.22	540.9	494.4	486.1	810.2	130	163	63	107	47	140	12
Means	16.98	6.8	7.9	41.1	29.5	10.9	17.9	7.5	.....	4.3	4.9	3.7	4.3	30.9	35.2	35.1	33.7	74.8	55.9	71.8	67.5	38.5	45.8	17.7	30.1	13.2	24.1	03.4
	Percentages.																											

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 5.38 a. m., 1.39 p. m., and 9.38 p. m., local time. Correction for instrumental error of barometer used: From 5.38 a. m., January 1, to 9.38 p. m., December 31, inclusive, +.011 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.380; April, 1.340; May, 1.280; June, 1.280; July, 1.270; August, 1.270; September, 1.290; October, 1.330; November, 1.380; December, 1.430.

E. H. THOMPSON,  
Corporal, Signal Corps, U. S. A.

APPENDIX 76.—*Meteorological summary for the year ending December 31, 1883—Continued.*

YUMA, ARIZ.

[Latitude, 32° 45' N.; longitude, 114° 38' W. Magnetic variation, 13° 45' E. Elevation of barometer above sea-level, 141 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Month.	Barometer (corrected for temperature and instrumental error only).										Temperature.						Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.			Monthly mean.			Highest.			Lowest.			Date.			Range.			Washington time.			Self-registering thermometers.			Mean maximum.			Mean minimum.			Washington time.			Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 a. m.	3 p. m.	11 p. m.	I <sub>n</sub> .	I <sub>a</sub> .	I <sub>b</sub> .	Date.	Range.	Date.	I <sub>n</sub> .	I <sub>a</sub> .	I <sub>b</sub> .	Date.	Range.	Date.	I <sub>n</sub> .	I <sub>a</sub> .	I <sub>b</sub> .	Date.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	11 p. m. to 7 a. m.	7 a. m. to 3 p. m.	3 p. m. to 11 p. m.	Total.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

<sup>1</sup> Seventy miles lost by self-register.<sup>2</sup> By dial.<sup>3</sup> One 7 a. m., one 3 p. m., and two 11 p. m. observations missed.<sup>4</sup> No observations taken.

[illegible]

**\* Inappreciable.**

<sup>a</sup> One 7 a. m., one 3 p. m., and two 11 p. m. observations missed.

**No observations taken.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.30 a. m., 12.30 p. m., and 8.30 p. m., local time.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.30 a. m., 12.30 p. m., and 8.30 p. m., local time.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond with 4.30 a. m., 12.30 p. m., and 8.30 p. m., local time. Correction for instrumental error of barometer used: From 4.30 a. m., January 1, to 8.30 p. m., November 29, inclusive, —.011 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.150; February, 0.150; March, 0.150; April, 0.150; May, 0.150; June, 0.140; July, 0.140; August, 0.140; September, 0.140; October, 0.140; November, 0.150.

**W. S. DELANO,**  
*Private, Signal Corps, U. S. A.*



## APPENDIX 77.

*Annual summary, 1882, of international simultaneous observations.*

[illegible]

BRITISH.		CANADIAN.	
Tientsin	N. 45 39 E. 13 46	Bathurst	N. 47 39 W. 65 43
Yokohama	N. 48 12 E. 16 22	Charlottetown	N. 46 14 W. 63 20
		Chatham	N. 47 03 W. 65 20
Aberdeen	N. 54 10 W. 2 06	Cherbourg	N. 48 04 W. 66 22
Amoy	N. 54 21 W. 6 39	Colon	N. 48 04 W. 66 22
Batavia	N. 53 35 W. 3 04	Corwall	N. 45 01 W. 66 22
Bombay	N. 53 25 W. 2 28	Dalhousie	N. 48 04 W. 66 22
Bremer	N. 53 48 W. 1 47	Father Point	N. 45 57 W. 66 22
Calcutta	N. 51 25 E. 0 53	Fredericton	N. 43 12 W. 63 26
Canton	N. 51 25 E. 0 53	Gallatin	N. 44 39 W. 63 26
Changhai	N. 50 09 E. 31 00	Hamilton	N. 43 16 W. 79 53
Colon	N. 50 09 E. 31 00	Kangaroo	N. 44 12 W. 59 58
Port Napier	N. 53 53 W. 4 17	Little Glouce Bay	N. 46 13 W. 73 53
Preso Town	N. 53 53 W. 4 17	Montreal	N. 45 13 W. 73 53
Gibraltar	N. 53 53 W. 4 17	Perry Sound	N. 45 19 W. 80 01
Greenwich	N. 53 53 W. 4 17	Peterboro	N. 44 17 W. 73 53
Guernsey	N. 53 53 W. 4 17	Port Dover	N. 43 47 W. 80 13
Kowloon	N. 53 53 W. 4 17		
Leicester	N. 53 53 W. 4 17		
Malacca	N. 53 53 W. 4 17		
Nassau	N. 53 53 W. 4 17		
Oceot	N. 53 53 W. 4 17		
Oxford	N. 53 53 W. 4 17		
Plymouth	N. 53 53 W. 4 17		
Sandwich	N. 53 53 W. 4 17		
Seaford	N. 53 53 W. 4 17		
Sheffield	N. 53 53 W. 4 17		
Silcock Rectory	N. 53 53 W. 4 17		
Stonhurst	N. 53 53 W. 4 17		
Strathfield	N. 53 53 W. 4 17		
Turro	N. 53 53 W. 4 17		
Valencia	N. 53 53 W. 4 17		

APPENDIX 77.—Annual summary, 1882, of international simultaneous observations—Continued.

Result of simultaneous observations for the year 1882.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Stations.	Latitude.	Longitude.	Local time.	Feet.	Meters.	Mean barometer.				Mean temperature.		Mean relative humidity.	Wind.										Total precipitation.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
						Actual.		Reduced.		Centigrade.	Fahrenheit.		Directions.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
						Inches.	Millimeters.	Inches.	Millimeters.				N.	N.W.	W.	S.W.	S.	S.E.	E.	N.E.	Calm.	Blank.			Miles.	Kilometers.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
CANADIAN—Cont'd.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Po t Stanley .....	N. 42 40	W. 81 13	6.43 a.m.	562	180	29.40	746.730.05	763.342.1	5.686.7	45	32.115	26.14	23.69	34	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....</

[illegible]

**FRANCO.**

**GERMAN.**

## APPENDIX 77.—Annual summary, 1892, of international simultaneous observations—Continued.

Station.	Latitude.	Longitude.	Local time.	Altitude of barometer above sea.	Result of simultaneous observations for the year 1892.										Total precipi- tation.					
					Mean barometer.			Mean temper- ature.		Directions.										
					Actual.		Reduced.	Fahrenheit.	Centigrade.	Total move- ment.										
					Inches.	Millimeters.				Inches.	Millimeters.	Blank.	Calim.	SE.	SW.	W.	NW.			
				Feet.	Meters.	Mean relative humidity.				N.	NW.	W.	SW.	S.	SE.	E.	NE.			
						Inches.	Millimeters.													

Paina	N. 25 37	E. 85 08	5.49 p.m.	183	56	230	58	751	329	76	755	981	3	27	498	3	25	67	81	17	6	17	73	81	18	.....	3.8	34.72	881.9
Hawabagh	N. 24 00	E. 85 24	5.40 p.m.	2,007	612	27	74	704	629	75	755	877	8	25	482	2	83	118	38	15	19	28	31	14	19	.....	4.8	54.87	1,382.7
Catuck	N. 20 39	E. 85 24	5.40 p.m.	21	24	26	68	753	923	76	755	982	3	27	986	4	48	10	26	70	37	8	44	11	10	.....	4.2	70.41	2,017.0
Calcutta	N. 22 33	E. 86 21	6.01 p.m.	21	35	26	73	753	129	76	755	976	9	26	171	1	8	7	26	70	70	30	18	11	10	.....	4.4	66.18	1,680.9
Dharr	N. 26 01	E. 88 50	6.09 p.m.	115	28	26	64	752	828	76	755	977	6	25	741	1	8	7	26	70	70	30	18	11	10	.....	3.6	107.83	2,741.4
Chittagong	N. 22 21	E. 81 50	6.15 p.m.	187	102	26	71	754	628	80	758	978	3	25	741	1	8	7	26	70	65	9	14	19	20	.....	4.5	4.99	1,284.7
Singapur	N. 26 58	E. 81 40	6.27 p.m.	333	436	26	71	754	328	80	758	975	3	24	181	7	4	7	4	65	9	14	19	20	30	.....	5.5	82.19	2,087.6
Sydney	N. 28 55	E. 75 50	5.05 p.m.	1,431	7	26	64	753	129	76	755	984	7	20	30	3	35	14	58	37	15	27	80	30	.....	5.8	23.31	2,592.1	
Zanzibar	S. 6 10	E. 39 11	2.45 p.m.	23	7	26	64	753	129	76	755	984	7	20	30	3	35	14	58	37	15	27	80	30	.....	5.5	48.17	1,223.5	
ITALIAN.																													
Udine	N. 46 04	E. 13 13	1.01 p.m.	381	110	26	63	752	630	83	762	761	3	16	359	8	14	10	21	49	46	22	43	42	115	3	5.4	69.45	1,764.0
Milan	N. 45 28	E. 9 11	0.45 p.m.	482	147	26	49	748	630	82	762	560	7	15	759	2	18	33	54	78	28	70	36	39	.....	4.9	49.80	1,267.2	
Padua	N. 45 24	E. 11 53	0.56 p.m.	102	258	31	26	65	752	630	83	762	761	3	15	759	2	18	33	54	78	28	70	36	39	.....	5.2	31.55	801.4
Moncalieri	N. 44 20	E. 7 41	0.39 p.m.	186	48	26	65	752	630	83	762	761	3	14	761	0	46	58	12	48	48	18	48	68	47	.....	4.4	34.00	863.6
Genoa	N. 44 24	E. 8 55	0.44 p.m.	157	556	26	65	757	630	82	762	562	9	17	264	5	58	15	6	110	28	78	14	36	20	.....	4.6	53.34	1,354.8
Mondovì	N. 43 23	E. 7 48	0.39 p.m.	1,824	14	26	64	752	630	83	762	557	0	13	655	6	29	78	17	9	1	28	25	1	2	.....	4.6	28.84	732.5
Genoa	N. 43 23	E. 12 53	1.00 p.m.	240	73	26	66	761	630	82	762	560	8	16	868	8	114	27	24	40	8	14	28	25	1	.....	5.6	22.40	568.9
Pesaro	N. 43 23	E. 12 53	1.00 p.m.	240	73	26	66	761	630	82	762	560	8	16	868	8	114	27	24	40	8	14	28	25	1	.....	5.6	22.40	568.9
Florence	N. 43 46	E. 11 18	0.55 p.m.	240	73	26	76	753	630	82	762	564	5	18	1,354	0	28	54	53	42	6	27	69	1	.....	5.3	40.14	1,019.5	
Leghorn	N. 43 46	E. 11 18	0.49 p.m.	164	72	26	89	759	630	82	762	564	5	18	1,354	0	28	54	53	42	6	27	69	1	.....	5.3	31.42	788.1	
Rome	N. 41 54	E. 12 19	0.56 p.m.	164	50	26	85	758	630	82	762	567	9	19	949	5	84	27	61	107	53	8	14	3	.....	5.7	26.99	685.5	
Verona	N. 40 22	E. 18 12	1.21 p.m.	226	72	26	77	756	630	82	762	567	9	19	949	5	84	27	61	107	53	8	14	3	.....	3.9	17.37	441.2	
Lecco	N. 39 19	E. 16 17	1.13 p.m.	240	55	26	81	767	630	82	762	566	9	19	949	5	84	27	61	107	53	8	14	3	.....	5.0	36.87	938.5	
Coenza	N. 39 19	E. 9 00	0.45 p.m.	180	55	26	81	757	630	82	762	566	9	19	949	5	84	27	61	107	53	8	14	3	.....	3.6	15.36	380.1	
Capri	N. 38 07	E. 13 21	1.02 p.m.	268	72	26	81	757	630	82	762	566	9	19	949	5	84	27	61	107	53	8	14	3	.....	4.5	20.14	511.5	
Palermo	N. 37 03	E. 15 15	1.09 p.m.	72	22	26	98	761	630	82	762	568	9	20	533	6	18	13	47	37	8	35	55	77	4	.....	5.2	12.40	340.4
Syracuse	N. 37 03	E. 15 15	1.09 p.m.	72	22	26	98	761	630	82	762	568	9	20	533	6	18	13	47	37	8	35	55	77	4	.....	5.2	12.40	340.4
Sub-series.																													
Naples	N. 40 52	E. 14 15	1.05 p.m.	480	149	26	50	748	630	82	762	566	4	19	1,014	4	25	17	43	124	30	33	59	.....	1	4.8	33.57	552.7	
St. Angelo	N. 46 32	E. 10 25	0.50 p.m.	8,343	2,543	22	14	662	6	.....	340	1	103	8	2	3	56	104	27	57	42	74	.....	.....	.....	4.8	53.18	1,350.7	
Valdabbia	N. 45 47	E. 7 51	0.40 p.m.	8,360	2,548	22	14	662	6	.....	340	1	103	8	2	3	56	104	27	57	42	74	.....	.....	.....	6.1	94.20	2,362.6	
JAPANESE.																													
Awamori	N. 40 51	E. 140 45	9.31 p.m.	22	10	26	64	760	529	87	761	247	5	8	682	7	43	11	90	4	69	18	45	8	36	.....	6.5	43.92	1,115.6
Hakodate	N. 41 47	E. 140 44	9.31 p.m.	10	4	26	64	760	529	87	761	245	8	7	781	5	60	36	65	18	9	23	79	24	61	.....	5.9	46.23	1,174.2
Hiroshima	N. 34 23	E. 132 27	8.56 p.m.	14	3	26	64	760	529	87	761	245	8	7	781	5	60	36	65	18	9	23	79	24	61	.....	6.3	44.66	1,131.8
Kanagawa	N. 36 23	E. 136 40	9.14 p.m.	95	29	26	96	761	630	86	763	553	9	12	284	3	52	46	20	46	18	82	27	8	.....	7.2	48.74	1,238.0	
Kioto	N. 35 01	E. 135 47	9.11 p.m.	162	20	26	96	761	630	86	763	553	9	12	284	3	52	46	20	46	18	82	27	8	.....	5.3	106.11	2,995.1	
Nagasaki	N. 32 44	E. 139 52	8.24 p.m.	189	58	26	95	758	630	86	763	558	8	14	980	6	79	28	14	37	23	73	49	26	.....	7.2	62.60	1,386.0	
Niigata	N. 37 55	E. 139 03	9.24 p.m.	32	10	26	93	757	630	84	763	558	8	14	980	6	79	28	14	37	23	73	49	26	.....	6.2	47.67	1,210.8	
Noboru	N. 38 23	E. 141 11	9.22 p.m.	15	5	26	97	761	630	86	763	551	5	10	888	3	100	39	21	14	56	20	31	20	2	.....	6.3	44.61	976.5
Supporo	N. 43 04	E. 141 23	9.23 p.m.	60	18	26	92	760	630	86	763	551	5	10	888	3	100	39	21	14	56	20	31	20	2	.....	5.8	58.06	1,474.7
Tokai	N. 35 41	E. 139 46	9.27 p.m.	69	21	26	92	760	630	86	763	558	8	14	980	6	79	28	14	37	23	73	49	26	.....	6.0	47.51	1,206.7	
Wakayama	N. 34 14	E. 135 49	9.09 p.m.	43	15	26	97	761	630	86	763	558	8	14	980	6	79	28	14	37	23	73	49	26	.....	6.0	47.51	1,206.7	
MAURITIUS.																													
Mauritius	S. 20 05	E. 57 33	3.58 p.m.	151	55	26	86	753	630	84	763	976	7	24	847	8	15	14	16	12	10	43	190	65	.....	15.6	56.12	1,425.4	

APPENDIX VI.—Annual summary, 1882, of international simultaneous observations—Continued.

Result of simultaneous observations for the year 1882.																									
Stations.	Latitude.	Longitude.	Local time.	Feet.	Meters.	Mean barometer.				Mean temperature.		Mean relative humidity.	Wind.										Total precipitation.		
						Actual.				Reduced.			Centigrade.	Fahrenheit.	Directions.										
						Inches.	Millimeters.	Inches.	Millimeters.	N.W.	W.				S.W.	S.	S.E.	E.	N.E.	Calm.	Blank.	Miles.		Kilometers.	
MEXICAN.																									
Leon	N. 21 07	W. 101 35	5.28 a. m.	5,901	1,790	24.38619	2.30	10.764	555.0	12.882.9	P. 67	76.164	4 24 4 23 6 54 9 1									4.4	127.63	1701.8	
Mazatlan	N. 23 11	W. 106 17	5.03 a. m.	249	76	29.71754	6.23	97.761	270.8	21.685.0	26.90	6 10 3 84 73 125 6 2											4.4	16.77	426.0
Mexico	N. 19 26	W. 99 00	5.32 a. m.	7,490	2,293	23.13587	5.30	21.767	351.3	10.775.8	7 50 12 8 1 2 285												4.8	25.97	659.6
Morelia	N. 19 42	W. 101 06	5.21 a. m.	6,247	1,940	24.16613	7.30	31.769	556.6	13.767.8	22 2 6 9 48 172 34 72												2.9	125.08	1652.3
Pabellon	N. 22 04	W. 102 04	5.20 a. m.	6,812	1,924	23.97608	8.23	99.761	755.3	12.974.7	25 23 35 27 5 7 2 17 217 7												17.43	442.7	175.0
Puebla	N. 19 02	W. 98 03	5.36 a. m.	7,113	2,168	23.44593	4.30	22.767	650.3	10.275.0	11 15 1 1 1 27 209												2.9	155.36	1,406.1
NETHERLANDS.																									
Flushing	N. 51 24	E. 3 35	0.22 p. m.	0	0	29.97761	2.23	97.761	533.8	12.1	26 21 79 58 44 37 21												28.93	734.8	734.8
Groningen	N. 53 12	E. 6 24	0.34 p. m.	(1)	(1)	29.88753	9.23	93.760	552.5	11.4	35 44 39 92 74 25 33 22												32.43	823.7	823.7
Helder	N. 52 58	E. 4 45	0.27 p. m.	0	0	29.92760	0.23	92.760	550.6	10.3	22 32 46 65 90 34 42 34												33.43	849.1	849.1
Hellevoetsluis	N. 51 49	E. 4 06	0.25 p. m.	0	0	29.95760	7.23	95.760	553.3	11.876.3	15 37 59 106 40 35 41 33 9												28.57	725.7	725.7
Utrecht	N. 52 05	E. 5 07	0.29 p. m.	43	13	29.94760	5.23	90.761	553.8	12.173.7	20 21 45 96 80 53 27 23												6.1	37.28	946.9
NORWEGIAN.																									
Bergen	N. 60 24	E. 5 20	0.29 p. m.	56	17	29.74753	4.23	80.753	548.1	8.968.8	22 63 34 26 115 70 22 1 12												6.8	78.55	1,085.1
Brono	N. 65 28	E. 12 14	0.57 p. m.	34	10	29.73753	1.23	77.753	545.2	7.865.9	41 28 26 79 27 53 36 37 46												6.3	31.76	788.5
Christiania	N. 59 53	E. 10 45	0.51 p. m.	134	41	29.68754	1.23	84.757	547.8	8.869.7	44 20 23 64 23 53 52 7												7.1	31.74	806.2
Gjesvaer	N. 71 07	E. 25 22	1.49 p. m.	23	7	29.67753	6.23	69.754	537.8	3.2	20 30 60 40 36 48 33 37 61												7.4	28.57	725.7
Lodingen	N. 68 24	E. 16 01	1.12 p. m.	43	13	29.66754	1.23	74.755	541.2	5.170.7	30 20 23 85 26 15 31 48 66												6.2	47.68	1,211.0
PORTUGUESE.																									
Angra	N. 38 39	W. 27 14	10.19 p. m.	144	44	29.11753	4.30	10.764	567.8	64.7	18 27 9 39 40 33 33 29 81 32 9 2												4.0	22.85	593.1
Campanha	N. 39 02	W. 6 59	11.40 p. m.	945	288	30.12765	0.80	21.767	564.6	20.361.9	33 17 69 60 58 15 57 48 8												4.5	17.02	432.3
Lisbon	N. 38 43	W. 9 08	11.51 p. m.	335	102	29.81757	2.30	17.766	562.9	17.363.4	26 4 17 20 9 40 31 18 19 1												4.5	16.14	384.6
											27 64 12 14 21 48 11												4.5	16.14	384.6
											27 64 12 14 21 48 11												4.5	16.14	384.6

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APPENDIX 77.—Annual summary, 1892, of international simultaneous observations—Continued.

Stations.	Result of simultaneous observations for the year 1892.										Total precipi- tation.																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Latitude	Longitude	Local time	Altitude of barometer above sea.	Mean barometer.			Mean temper- ature.		Wind.								Total move- ment.		Inches.	Millimeters.																																																																																																																																																																																																																																																																																																																																																																																																																									
					Feet.	Meters.	Inches.	Millimeters.	Fahrenheit.	Centigrade.	Mean relative humidity.	Directions.										Miles.	Kilometers.																																																																																																																																																																																																																																																																																																																																																																																																																							
												Actual.	Reduced.	Directions.																																																																																																																																																																																																																																																																																																																																																																																																																																
														N.	N.W.	W.	S.W.	S.	S.E.					E.	N.E.	Calms.	Blank.																																																																																																																																																																																																																																																																																																																																																																																																																			
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Boston	142	4823	60735	2530	05763	344	9	7	275	1	23	87112	60	17	18	10	83	5	...	88	409142	2705	5	43	821	112	0		
Brownville	43	1320	65760	7300	01762	260	4	20	880	8	13	3	3	80	75	14	10	108	1	1	90	408100	2735	6	32	56	827	0	
Buffalo	60	2120	68700	7130	01762	260	4	6	974	7	10	3	4	80	87	14	11	111	1	1	90	410145	490	6	32	56	827	0	
Bufford, Fort	B.1876	5723	69711	2300	04763	043	6	0	974	7	23	24	18	48	74	19	28	27	2	2	67	686124	779	4	12	79	923	8	
Burlington	249	1123	73755	4300	04763	043	6	5	675	1	26	26	32	61	17	20	27	34	...	...	67	827108	240	7	25	64	651	2	
Calo	B.2774	8207	73755	4300	04763	043	6	9	608	7	26	26	32	61	17	20	27	34	...	...	67	434108	251	5	61	561	564	1	
Camp Thomas	27	550	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Cape Henry	27	550	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Cedar Key	27	550	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Cedar Key	27	550	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Champaign	677	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Charleston	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Charlotte	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Chattanooga	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Chicago	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Chincoteague	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Cincinnati	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Cleveland	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Coleman City	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Columbus	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Concho, Fort	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Custer, Fort	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Davenport, Fort	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Dayton	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Deadwood	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Delaware Breakwater	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Denison	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Denver	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Des Moines	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Detroit	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Dodge City	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Douglas	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Duluth	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Eagle Pass	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Eagle Rock	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Edgemoor	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Elkhart, Fort	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
El Paso	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Erie	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Escondido	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Fredericksburg	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Galveston	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Grand Haven	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Grant, Fort	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Hatteras	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Helen	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Honolulu	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Huron	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0
Indianapolis	682	224	68764	3300	01762	260	4	13	78	2	21	17	37	10	35	5	8	145	10	10	112	191	180	140	5	8	86	220	0

APPENDIX 77.—*Annual summary, 1882, of international simultaneous observations—Continued.*

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### REPORT OF THE CHIEF SIGNAL OFFICER.

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APPENDIX 77.—Summary of international simultaneous meteorological observations for the year 1882.—Continued.

Stations.	Result of simultaneous observations for the year 1882.																			Total precipi- tation.								
	Latitude.	Longitude.	Local time.	Altitude of barometer above sea.		Mean barometer.			Mean temper- ature.	Mean relative humidity.	Wind.																	
						Actual.	Reduced.	Directions.								Total move- ment.												
								Inches.			Millimeters.	Inches.	Millimeters.	Fahrenheit.	Centigrade.		N.											
																	N.W.	W.	S.W.		S.	S.E.	E.	N.E.	Calm.	Blank.	Miles.	Kilometers.
UNITED STATES—Con- tinued.																												
Violasburg .....	N. 82 23	W. 90 53	6 04 a. m.	248		74.28	84.757	9.80	10.764	561.1	18.2	68.4	43	28	11	21	55	92	43	89	34	42, 711	68, 785	5.8		71.561	817.6	
Washington .....	N. 88 04	W. 77 02	7 00 a. m.	106		82.80	01.762	2.80	12.765	050.6	10.3	80.6	61	81	14	22	42	11	18	44	82	83, 854	64, 137	6.5		44.791	1188.4	
Williamport .....	N. 41 16	W. 77 03	7 00 a. m.	561		171.28	49.745	0.80	10.764	545.0	7.8	77.3	21	67	97	10	24	87	26	78		43, 869	68, 890	6.5		38.11	968.4	
Winnemucca .....	N. 34 14	W. 77 57	6 56 a. m.	52		16.80	06.763	0.80	11.764	860.0	15.6	61.4	43	40	66	47	10	10	80	90	40	53, 031	68, 889	6.4		82.291	222.2	
Winneux .....	N. 40 09	W. 117 43	4 17 a. m.	4 237		1.291	25.04	651	2.86	14.763	886.4	2	402	6	18	6	185	21	7	13	146	12	76, 896	121, 287	1.1		10.46	268.7
Yankton .....	N. 42 04	W. 97 28	5 38 a. m.	1 228		874.28	71.728	2.86	06.763	540.6	4.8	74.1	81	70	83	29	27	41	28	76		66, 919	107, 699	4.4		20.68	524.0	
Yuma .....	N. 83 45	W. 114 36	4 30 a. m.	1 138		43.28	78.766	4.28	03.760	260.8	15.7	68.1	65	37	18	81	11	89	30	64	80	47, 938	77, 188	2.0		1.78	45.3	
Sub-series.																												
Bogota .....	N. 4 36	W. 74 14	7 11 a. m.	8 655		2.683	22.04	536.8	.....	52.9	11.6	76.4	18	20	33	37	35	37	26	80	185	.....	.....	6		83.38	912.6	
Paramaribo .....	N. 5 50	W. 55 18	8 27 a. m.	6		3.80	04.763	0.86	04.763	978.6	25.8	85.6	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.9		133.134	137.4
Puerto Barrio .....	N. 6 23	W. 74 38	7 10 a. m.	543		160.28	43.747	5.83	06.760	779.1	26.1	85.8	49	2	34	8	9	7	268	.....	.....	.....	.....	.....	.....	92.692	234.3	
Rivas .....	N. 11 36	W. 85 47	6 35 a. m.	150		46	.....	.....	.....	.....	.....	17.8	8	11	6	80	15	93	9	.....	.....	.....	.....	.....	.....	60.311	831.8	
York Factory .....	N. 57 02	W. 92 36	5 58 a. m.	86		17.80	01.763	2.86	06.763	515.7	.....	68.6	69	84	45	49	36	28	49	.....	.....	.....	.....	.....	.....	.....	38.77	664.6

Ocean square data for the year 1892.

Location of center of each square.	Barometer.		Temperature.		Wind frequency.											Force.	
	Inches.	Millimeters.	Fahrenheit.	Centigrade.													
					N.	NW.	W.	SW.	S.	SE.	E.	NE.	Calm.	Blank.	0-10.		
N. 12.5 W. 22.5	30.08	762.7	79.4	26.3	6	1	2	4	.....	1	10	815	1	25	1.7		
N. 17.5 W. 22.5	30.08	764.0	76.8	24.9	12	14	.....	1	10	76	18	202	.....	41	1.8		
N. 22.5 W. 22.5	30.10	764.5	77.4	25.2	15	12	4	12	15	72	108	105	.....	45	1.8		
N. 22.5 W. 27.5	30.10	764.5	77.5	25.3	12	7	1	11	13	84	85	120	.....	51	1.6		
N. 22.5 W. 32.5	30.09	764.8	77.6	25.3	15	12	1	12	6	41	60	177	.....	12	1.9		
N. 27.5 W. 22.5	30.19	766.8	71.8	22.1	16	13	1	12	6	41	60	177	.....	33	2.0		
N. 27.5 W. 27.5	30.20	767.1	72.3	22.4	11	11	14	18	14	58	77	112	.....	1	2.0		
N. 27.5 W. 32.5	30.12	765.0	73.7	23.2	43	42	7	42	39	57	80	60	.....	1	1.8		
N. 27.5 W. 37.5	30.11	764.8	73.9	23.3	46	49	4	36	50	46	25	81	.....	1	2.0		
N. 27.5 W. 42.5	30.12	765.0	74.3	23.5	40	40	3	34	50	53	51	86	.....	8	2.0		
N. 27.5 W. 47.5	30.12	765.0	73.3	22.9	36	33	10	30	49	80	49	77	.....	1	1.9		
N. 32.5 W. 22.5	30.18	766.6	68.4	20.2	79	24	8	46	8	26	11	161	.....	2	1.7		
N. 32.5 W. 27.5	30.21	767.3	68.6	20.3	34	16	11	74	13	49	17	140	.....	11	1.4		
N. 32.5 W. 32.5	30.23	767.8	68.9	20.5	29	27	12	30	25	40	28	147	.....	27	1.8		
N. 32.5 W. 37.5	30.23	767.8	69.6	20.9	21	30	8	34	23	89	53	73	.....	34	2.1		
N. 32.5 W. 42.5	30.21	767.3	70.0	21.1	14	34	34	48	48	81	72	55	.....	37	2.3		
N. 32.5 W. 47.5	30.19	766.8	70.0	21.1	19	33	12	54	81	71	24	24	.....	2	2.2		
N. 32.5 W. 42.5	30.17	766.3	70.0	21.1	19	33	12	58	72	66	18	31	.....	1	2.2		
N. 32.5 W. 47.5	30.14	765.5	69.6	20.9	17	42	16	64	77	49	14	83	.....	1	2.3		
N. 32.5 W. 52.5	30.12	765.0	69.8	21.0	24	45	17	61	68	43	17	81	.....	40	2.3		
N. 32.5 W. 57.5	30.13	765.0	69.8	21.0	24	61	14	60	60	38	8	41	.....	5	1.9		
N. 32.5 W. 62.5	30.09	764.3	69.3	20.7	60	87	10	64	62	38	9	41	.....	10	2.2		
N. 32.5 W. 72.5	30.10	764.5	69.4	20.8	63	60	4	59	63	38	9	61	.....	2	2.4		
N. 32.5 W. 77.5	30.10	764.5	65.4	18.6	54	58	8	99	30	20	12	98	.....	1	2.1		
N. 37.5 W. 12.5	30.16	766.1	64.8	18.2	98	84	23	16	16	24	9	64	.....	.....	2.3		
N. 37.5 W. 17.5	30.19	766.8	65.1	18.4	63	83	42	61	19	24	9	64	.....	.....	2.2		
N. 37.5 W. 22.5	30.23	767.8	65.5	18.6	66	97	20	54	29	41	11	47	.....	1	2.0		
N. 37.5 W. 27.5	30.23	767.8	65.7	18.7	42	78	38	51	56	61	17	21	.....	1	2.6		
N. 37.5 W. 32.5	30.18	766.6	65.8	18.8	25	56	33	108	77	38	4	16	.....	8	2.9		
N. 37.5 W. 37.5	30.15	766.8	65.3	18.5	23	64	31	106	85	25	9	14	.....	8	2.9		
N. 37.5 W. 42.5	30.11	764.8	64.2	17.9	31	65	22	719	70	26	10	26	.....	12	3.0		
N. 37.5 W. 47.5	30.08	764.0	62.8	17.1	80	69	22	105	75	18	9	26	.....	11	3.0		
N. 37.5 W. 52.5	30.04	763.0	61.5	16.4	51	86	21	74	61	32	3	30	.....	7	2.1		
N. 37.5 W. 57.5	30.04	763.0	61.1	16.2	45	104	18	61	56	30	11	38	.....	1	2.1		
N. 37.5 W. 67.5	30.06	763.5	58.5	14.7	79	77	10	60	47	35	9	42	.....	2	2.1		
N. 37.5 W. 72.5	30.07	763.8	55.5	13.1	79	77	10	63	32	37	11	54	.....	1	1		
N. 42.5 W. 12.5	30.12	765.0	61.7	16.5	38	105	38	77	24	22	18	56	.....	1	2.7		
N. 42.5 W. 17.5	30.15	765.8	61.6	16.4	28	122	57	68	28	16	9	35	.....	.....	2.9		
N. 42.5 W. 22.5	30.15	765.8	62.0	16.7	28	120	49	63	36	31	3	21	.....	3	2.0		
N. 42.5 W. 27.5	30.14	765.5	62.1	16.7	21	85	53	126	43	19	1	14	.....	2	2.2		
N. 42.5 W. 32.5	30.11	764.8	61.9	16.6	22	79	43	136	67	11	1	4	.....	2	2.4		
N. 42.5 W. 37.5	30.06	763.5	59.3	16.1	22	89	39	124	70	10	3	8	.....	.....	2.5		
N. 42.5 W. 42.5	30.05	763.3	59.3	15.2	34	84	41	111	69	12	5	9	.....	1	2.5		
N. 42.5 W. 47.5	30.03	762.7	55.8	13.2	83	91	21	99	66	23	5	26	.....	1	2.4		
N. 42.5 W. 52.5	30.00	762.0	54.5	12.5	94	86	12	104	61	35	7	25	.....	1	2.5		
N. 42.5 W. 57.5	30.09	761.7	52.9	11.6	42	97	27	69	62	26	11	31	.....	.....	2.9		
N. 42.5 W. 62.5	30.00	762.0	51.0	10.6	46	102	21	67	54	31	5	39	.....	.....	2.9		
N. 47.5 W. 12.5	30.02	762.5	49.4	9.7	71	87	25	82	32	21	9	39	.....	.....	2.2		
N. 47.5 W. 17.5	30.09	761.7	56.1	13.7	29	82	78	79	45	37	15	22	.....	.....	2.7		
N. 47.5 W. 22.5	30.08	761.7	52.3	12.5	33	81	89	78	42	27	8	7	.....	.....	2.8		
N. 47.5 W. 27.5	30.08	761.5	50.0	13.8	30	88	81	82	46	31	6	10	.....	1	2.8		
N. 47.5 W. 32.5	30.07	761.2	52.2	12.9	34	105	61	83	59	11	6	6	.....	.....	2.9		
N. 47.5 W. 37.5	30.05	760.7	54.5	12.5	31	97	41	121	47	15	4	7	.....	2	3.0		
N. 47.5 W. 42.5	30.08	760.3	53.0	11.7	26	104	46	104	53	21	1	10	.....	.....	2.9		
N. 47.5 W. 47.5	30.01	759.7	49.7	9.8	37	90	41	110	44	33	2	14	.....	2	2.5		
N. 47.5 W. 52.5	30.07	759.2	44.9	7.2	34	77	37	108	43	29	8	22	.....	7	2.0		
N. 52.5 W. 12.5	30.00	759.4	43.3	12.0	26	84	66	73	62	25	9	20	.....	.....	2.8		
N. 52.5 W. 17.5	30.08	758.9	53.0	11.7	26	104	62	83	44	23	6	16	.....	1	2.9		
N. 52.5 W. 22.5	30.08	758.9	52.2	11.2	24	99	50	91	43	24	6	18	.....	1	2.8		
N. 52.5 W. 27.5	30.05	758.3	51.0	10.6	24	117	49	87	33	30	6	18	.....	1	2.8		
N. 52.5 W. 32.5	30.05	758.3	48.8	9.3	29	97	39	98	34	31	2	20	.....	15	2.6		
N. 52.5 W. 37.5	30.04	757.9	47.0	8.3	32	111	41	78	29	30	6	15	.....	25	2.3		
N. 57.5 W. 12.5	30.03	755.1	47.5	8.6	44	122	18	89	45	48	15	52	.....	3	2.5		
N. 57.5 W. 17.5	30.02	754.9	46.2	7.9	56	66	26	66	38	41	20	49	.....	3	2.3		
N. 57.5 W. 22.5	30.03	755.1	44.3	6.8	39	82	32	64	32	31	17	50	.....	6	2.2		
N. 57.5 W. 27.5	30.03	755.1	42.4	5.8	52	90	21	61	27	31	22	36	.....	16	2.0		
N. 57.5 W. 32.5	30.02	754.9	40.7	4.8	80	109	19	56	21	38	18	23	.....	41	2.0		

## GENERAL REMARKS.

All data which appear in the Daily Bulletin of Simultaneous Meteorological Observations are copied from the regular exchanges of this office. The barometer readings for land stations, in the first and second columns, are reduced to freezing and their respective standards; those in the third and fourth columns to sea-level. When necessary, corrections for instrumental error, temperature, and reduction to sea-level are always applied, while those for instrumental error, only when such corrections can be ascertained with close approximation, as by comparison when vessels are at or near land stations. Relative humidity generally requires computation from the hygrometrical observations. When rain has fallen, but neither the amount nor duration is recorded, the word "blank" is published in the rain-fall column. The weather is generally published as given. The following symbols and abbreviations are common to all series, viz: t, aneroid; \*, instrumental error not known; c, cirrus; k, cumulus; s, stratus; n, nimbus; d, scud; f, fracto; p, pallio; hz, haze; fg, fog; sk, smoke; inap, inappreciable; d, clouds, detached clouds. The movement of the air is published as given on the originals, when indicated by velocity in miles per hour, in meters per second, or by force, all variations of the latter being reduced to the common scale of 0 to 10. Those stations reporting the movement in pounds pressure per square foot are reduced to force on the common scale, and those in kilometers per hour, to meters per second and miles per hour. The distinction between upper and lower clouds is carefully made in the United States and a portion of the Canadian series, and the various formations are indicated by the letters above given and their combinations. In the monthly summary of international simultaneous meteorological observations the position of stations (latitude and longitude) are obtained from Keith Johnston's Index Geographicus, except where more exact information is furnished. The elevation of stations is obtained either from the annual, semi-annual, and monthly publications of the various meteorological bureaus here represented, or from the original forms, upon which are entered the daily observations. In the United States series the elevations are computed from the latest surveys, and are carefully revised each month, in order to note any change in the elevation of the barometer cistern at any station. It is believed for the most part that, throughout the European and other series, the elevations as given represent the height of the barometer cistern above sea-level; at least, this should be the case.

In the annual summary, where any change has occurred in the altitude of a station, the elevation given is that prevailing at the close of the year. The local time, where omitted or not given correctly in the originals, is carefully computed at this office. A letter placed opposite the name of a station or some portion of the data credited thereto, indicates that a certain number of observations are missing, corresponding to the relative position in the alphabet of the letter so used.

## INTERNATIONAL CHARTS ACCOMPANYING DAILY BULLETIN AND MONTHLY SUMMARY.

International Chart I shows isobars and isotherms charted from data as appearing in the international bulletin of same date, as reported by the several observers. Isobars, in continuous lines, exhibit atmospheric pressure at sea-level in English inches; isotherms, in dotted lines, exhibit temperature of the air in degrees, Fahrenheit, similarly charted. Broken lines indicate that the lines so broken are doubtful.

International Chart II (monthly mean chart), showing mean pressure at sea-level in English inches, mean temperature in degrees, Fahrenheit, mean force and prevailing direction of wind at 7 a. m., Washington mean time.

International Chart III shows tracks of centers of low barometer. The Arabic numerals show location of the centers of low barometer at 7 a. m., Washington mean time, of that date. Broken or dotted lines are doubtful.

Arrows show direction of, and fly with, the wind. Force is shown as follows:

Symbols.	Force.	Velocity.	
		Miles per hour.	Meters per second.
○	0	0	0
→	1, 2	0 to 9	0 to 4
→	3, 4	9.1 to 22.5	4.1 to 10.1
→	5, 6	22.6 to 40.5	10.1 to 18.1
→	7, 8	40.6 to 67.5	18.1 to 30.2
→	9, 10	67.6 up	30.2 and over.



The following remarks relate to the individual peculiarities in the *methods* of recording and the *times* of taking the international simultaneous meteorological observations, under the auspices of the various meteorological bureaux:

**ALGERIAN SERIES** (furnished by co-operation of General Maritz, commandant supérieur du Génie in Algeria).—The originals give the barometer in millimeters reduced to sea-level; temperature in centigrade. The movement of the air is indicated by force on a scale of 0 to 10. The rainfall is measured at 7 a. m., local time, and the amount indicated in millimeters.

**AUSTRALIAN SERIES** (furnished by co-operation of R. L. J. Ellery, director of the Observatory at Melbourne, N. S. W.).—At Melbourne the conversions are published as given in the originals. The movement of the air is indicated by velocity in miles per hour.

**AUSTRO-HUNGARIAN SERIES** (furnished by co-operation of Prof. Dr. Julius Hann, director of the Imperial and Royal Central Meteorological Institute at Vienna).—The originals give the barometer in millimeters reduced to sea-level and the temperature in centigrade. At the following stations rainfall is measured at local time: Lemburg, 7 p. m.; Vienna, 2 p. m.; Trieste, 7 a. m. The weather is given by the Vienna symbols or in general terms.

**BRITISH SERIES** (furnished by co-operation of the Meteorological Council, London, Robert H. Scott, esq., F. R. S., secretary, and respective observers).—In general the originals do not give rainfall or distinction between upper and lower clouds. Relative humidity, except for Bradford and Silloth Rectory, is not given on the originals, but is computed from hygrometrical observations. At Oxford and Sandwick Manse the barometers are given as read off. At Greenwich the movement of the air is indicated by pounds pressure per square foot. At the following stations rainfall is measured at local time: Bradford, 9 a. m., and Aberdeen, 10 a. m. The wind direction is given to 32 points and weather by the Beaufort notation.

**CANADIAN SERIES** (furnished by co-operation of Charles Carpmac, A. M., F. R. A. S., director of the Magnetic Observatory at Toronto and superintendent of the Meteorological Office of the Dominion of Canada, and respective observers).—The originals give the barometer reduced to sea-level in English inches and the temperature in Fahrenheit. Meteorological reports from stations marked with a \* are telegraphed daily to the office of the Chief Signal Officer of the Army.

**CAPE COLONY SERIES** (furnished by co-operation of the Meteorological Commission of Cape Colony, Cape Town, and respective observers).—At Cape Town the barometer is given on the original as corrected for temperature only. Upper and lower clouds are given on a scale of 0 to 10, and the kind occasionally indicated by abbreviating Poëy's classification.

**CHINESE SERIES** (furnished by co-operation of Marc Dechevrens, S. J., director of the Meteorological Observatory at Zi-Ka-Wei).—At Zi-Ka-Wei the originals give the barometer in millimeters reduced to sea level and the temperature in centigrade. The movement of the air is given in meters per second and the direction to 16 points. The kind of clouds is occasionally given, and the degree of cloudiness on the scale of 0 to 10; distinction between upper and lower clouds is sometimes made. The weather is given in general (French) terms. The rainfall is given in millimeters and measured at the moment of simultaneous observation.

**DANISH SERIES** (furnished by co-operation of Capt. N. Hoffmeyer, director of the Royal Danish Meteorological Institute at Copenhagen).—The originals give the barometer in millimeters reduced to sea-level and the temperature in centigrade. The movement of the air is indicated by force on a scale of 0 to 6. The weather is occasionally given by the Vienna symbols, but it is not certain that they always refer to the moment of simultaneous observations, except at Copenhagen. No distinction is made between upper and lower clouds, and the direction of movement, together with the rainfall, is entirely omitted.

**FRENCH SERIES** (furnished by co-operation of the central Meteorological Office of France, Prof. E. Mascart, director, and respective observers).—The originals give the barometer in millimeters reduced to sea-level and the temperature in centigrade. The movement of the air is indicated by force on a scale of 0 to 6, except in meters per second for Mont Louis and Perpignan. In general the rainfall is measured at 9 a. m., local time. The direction of upper and lower clouds is given, but no distinction is made as to kind. The degree of cloudiness is given on a scale of 0 to 4 at Clermont-Ferrand and Puy de Dome, while at other stations the scale of 0 to 10 is employed, or general weather terms, from which the amount of cloudiness is inferred. The weather is given in general terms, except occasionally by the Vienna symbols at Mont Louis and Perpignan. At Guéret the observations are taken at 12 m., instead of 12.16 p. m., and at Besançon at midday instead of 0.32 p. m.

**GERMAN SERIES** (furnished by co-operation of Prof. Dr. G. Neumeyer, director of the German Marine Observatory at Hamburg).—The originals give the barometer in millimeters reduced to sea level and the temperature in centigrade. The movement of the air is indicated by force on a scale of 0 to 10. The kind of clouds is occasion-



ally given, but no distinction is made between upper and lower; the amount is given on a scale of 0 to 10, but the kind is rarely given. The weather is given in Vienna symbols or in general terms. At Berlin observations are taken at 2 p. m., instead of 1.02 p. m.

**GREEK SERIES** (furnished by co-operation of Prof. Dr. J. F. Julius Schmidt, director of the Royal Observatory at Athens).—The originals give the barometer corrected for temperature only and the thermometer in centigrade. Hygrometrical observations are not given. The kind of clouds is occasionally given, and the amount is inferred from the general weather terms. The movement of the air is indicated by force on a scale of 0 to 10.

**INDIAN SERIES** (furnished by co-operation of H. F. Blanford, meteorological reporter to the Government of India at Calcutta).—The barometric observations refer to the Calcutta standard, which requires a correction of 0.011 inch, or 0.28 mm, as compared with the Kew standard. The wind velocity given is the average rate of wind since the observation of the preceding day. All conversions are published as given in the originals where the data are recorded to an additional decimal. The weather is given by the Beaufort notation, Vienna symbols, or special symbols.

**ITALIAN SERIES** (by authority of the minister of agriculture, industry, and commerce, furnished by co-operation of Prof. P. Tacchini, director of the Central Meteorological Office at Rome, and respective observers).—The originals give the barometer in millimeters reduced to sea-level and the temperature in centigrade. The movement of the air is indicated by velocity in kilometers per hour or by force on a scale of 0 to 4, as at Mondovì, Florence, and Cagliari. No distinction is made between upper and lower clouds, and the amount is given on a scale of 0 to 10.

**JAPANESE SERIES** (furnished by co-operation of I. Aral, director of the Imperial Meteorological Observatory at Tokyo).—The rainfall is measured at 9.30 a. m., local time, and the conversions are all published as given in the originals. Distinction is generally made between upper and lower clouds, and the amount is given on a scale of 0 to 10. The weather is given in general terms. During the months of July, August, and September, 1892, the rainfall at Nagasaki was measured at 9.36 p. m., and at Niigata during July and August at 10.13 p. m., local time.

**MAURITIUS SERIES** (furnished by co-operation of C. Meldrum, secretary of the Meteorological Society of Mauritius).—All conversions are published as given in the originals. The direction of the wind is given to 64 points, and the rainfall is measured at 9.30 a. m., local time.

**MEXICAN SERIES** (by authority of the secretary of public works—furnished by co-operation of Señor Mariano Barcena, director of the Central Meteorological Observatory in the City of Mexico, and respective observers).—All conversions are published as given in the originals, but when an evident mistake has been made, the data is queried at this office. The kinds of clouds is given, and also the direction and amount of both upper and lower. The degree of cloudiness is indicated on a scale of 0 to 10. Rainfall is generally measured at 6 a. m., local time.

**NETHERLANDS SERIES** (furnished by co-operation of Prof. Buys Ballot, director of the Royal Meteorological Institute of the Netherlands at Utrecht).—The originals give the barometer in millimeters reduced to sea-level and the temperatures in centigrade. The movement of the air is indicated by pressure in kilograms per square meter, except as Hellevoetsluis, which gives force on a scale of 0 to 12. The humidity is not given on the originals, but for two stations it is computed from the hygrometrical observations. The weather is only given for Utrecht, from which the amount of cloudiness at that station is inferred.

**NORWEGIAN SERIES** (furnished by co-operation of Prof. H. Mohn, director of the Royal Norwegian Meteorological Institute at Christiania).—The originals give the barometer in millimeters reduced to sea-level and their temperature in centigrade. The movement of the air is indicated by velocity in meters per second or by force on a scale of 0 to 6. The weather is occasionally given by Vienna symbols. At Bergen observations upon the weather and degree of cloudiness are made at 2 p. m., local time. At Brønnø the observations are taken at 2 p. m., instead of 12.57 p. m.

**PORTUGUESE SERIES** (furnished by co-operation of J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon).—In the originals the barometer is given in millimeters and the temperature in centigrade. The movement of the air is indicated by velocity in kilometers per hour. The weather is occasionally given by the Vienna symbols. The rainfall is measured at noon each day.

**RUSSIAN SERIES** (furnished by co-operation of Prof. H. Wild, director of the Imperial Central Physical Observatory of Russia at St. Petersburg).—The originals give the barometer in millimeters reduced to sea-level and the temperature in centigrade. At Astrakhan the barometer-cistern is below sea-level. The movement of the air is indicated by velocity in meters per second. No distinction is made between upper and lower clouds; the amount is given on a scale of 0 to 10, and the kind occasionally. The weather is occasionally given by the Vienna symbols.

**SPANISH SERIES** (furnished by co-operation of the Royal Observatory at Madrid, and respective observers).—The movement of the air, except for subseries, is given in kilometers per hour. The kind of clouds is occasionally given, and the degree of cloudiness on a scale of 0 to 10. The rainfall at San Juan is measured at 4 p. m., local time, and at San Fernando at midnight. The weather is given in general (Spanish) terms.

**SWEDISH SERIES** (furnished by co-operation of Prof. R. Rubenson, director of the Royal Swedish Meteorological Institute, and of Prof. H. H. Hildebrandsson, director of the Meteorological Observatory of the Upsala University).—The originals give the barometer in millimeters reduced to sea-level and the temperature in centigrade. The movement of the air is indicated by force on a scale of 0 to 6, except in meters per second for Upsala. The kind of clouds is not given, but the degree of cloudiness is indicated on a scale of 0 to 10. The rainfall is measured at 8 a. m., local time, and the weather is occasionally given by the Vienna symbols.

**SWISS SERIES** (furnished by co-operation of Prof. E. Plantamour, director of the observatory at Geneva).—The originals give the barometer in millimeters, corrected for temperature only, and the thermometer in centigrade. The movement of the air is indicated by force on a scale of 0 to 10.

**TURKISH SERIES** (furnished by co-operation of A. Coumbary, Effendi, director of the Central Observatory at Constantinople, and of Prof. C. V. A. van Dyck, superintendent of the Lee Observatory at Beirut).—The originals give the barometer in millimeters reduced to sea-level. The temperature is given in centigrade. The movement of the air is indicated by force on a scale of 0 to 7 for Valona, and on a scale of 0 to 12 for Beirut. At Constantinople the velocity is given in meters per second. The kind of clouds is not given, but the amount is indicated on a scale of 0 to 10, except at Valona, at which station it is inferred from the general weather terms.

**UNITED STATES SERIES** (by authority of the Secretary of War—furnished by co-operation of W. B. Hazen, brigadier and brevet major-general, Chief Signal Officer, U. S. Army).

**UNITED STATES SUB-SERIES** (furnished by co-operation of the respective observers). The originals generally give the barometer reduced to sea-level and the temperature at Fahrenheit.—At Bogota and Navassa the barometer is corrected for temperature only; at Puerto Berrio, is given as read off, and at Rivas is omitted. The movement of the air is generally indicated by velocity in miles per hour, except on a scale of 0 to 10 for Bogota, Paramaribo, and Rivas, and 0 to 12 for Puerto Berrio. The wind direction is generally given to 16 points, except 8 points for Bogota and 32 points for Rivas. At Rivas the humidity is obtained by readings from Saussure's hygrometer.

**BRITISH NAVAL SERIES** (furnished by co-operation of the Meteorological Council, London, Robert H. Scott, esq., F. R. S., secretary).—The originals give the barometer as read off. The wind direction is given to 32 points. The movement of the air is indicated by force on a scale of 0 to 12. The distinction between upper and lower clouds is made as to direction, but not as to amount. The height of the sea disturbance is given on a scale of 0 to 9, and the weather by the Beaufort notation. The direction of movement of wind, clouds, and sea is compass direction, corrected only for deviation caused by the iron in the ship, while the correction for magnetic variation is applied at this office. The humidity is not given, but is computed from the hygrometrical observations.

**PORTUGUESE NAVAL SERIES** (furnished by co-operation of J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon).—The originals give the barometer in millimeters, corrected for temperature only, and the thermometer in centigrade. The movement of the air is indicated by force on a scale of 0 to 10. The humidity is not given, but is computed from the hygrometrical observations. The kind of clouds is not given, but the amount is indicated on a scale of 0 to 10; the direction of movement is given without distinction between the upper and lower. The height of sea disturbance is given on a scale of 0 to 9 and the weather by the Beaufort notation. The rainfall is not measured, but the duration is generally given in hours and minutes.

**SWEDISH NAVAL SERIES** (furnished by co-operation of E. Malmburg, director of the Nautical Meteorological Bureau at Stockholm).—The originals give the barometer as read off. The movement of the air is indicated by force on a scale of 0 to 12, and the direction is corrected for magnetic variation at this office. The humidity is not given, but is computed from the hygrometrical observations. The rainfall is omitted. The height of the sea-swell is given on a scale of 0 to 9 and the weather by the Beaufort notation.

**UNITED STATES NAVAL SERIES** (by authority of the Secretary of the Navy—furnished by co-operation of the Navy Department, through Commodore John G. Walker, U. S. N., Chief of Bureau of Navigation).—The originals give the barometer as read off. The humidity is not given, but is computed from the hygrometrical observations. The sea-swell and weather are given in general terms. The direction of the wind is compass direction, corrected for variation.

**MERCHANT-MARINE SERIES** (furnished by co-operation of the owners, agents, &c., of the respective lines and vessels).—Same as U. S. Naval.

**OCEAN SQUARES.**—The table of ocean square data shows (1) the location of the centers of squares whose sides extend  $5^{\circ}$  each in latitude and longitude, (2) the number of days for which observations are at hand within the respective squares, and the total number of simultaneous observations reported on those days, (3) the monthly mean pressure and temperature of the air, and the mean force and total frequency of the wind at 7 a. m., Washington time, computed for the center of each square from daily readings as obtained by interpolation between the isobars and isotherms of the daily international simultaneous weather maps.





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